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News of the Industry Begins Page 525

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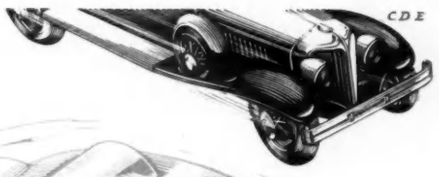
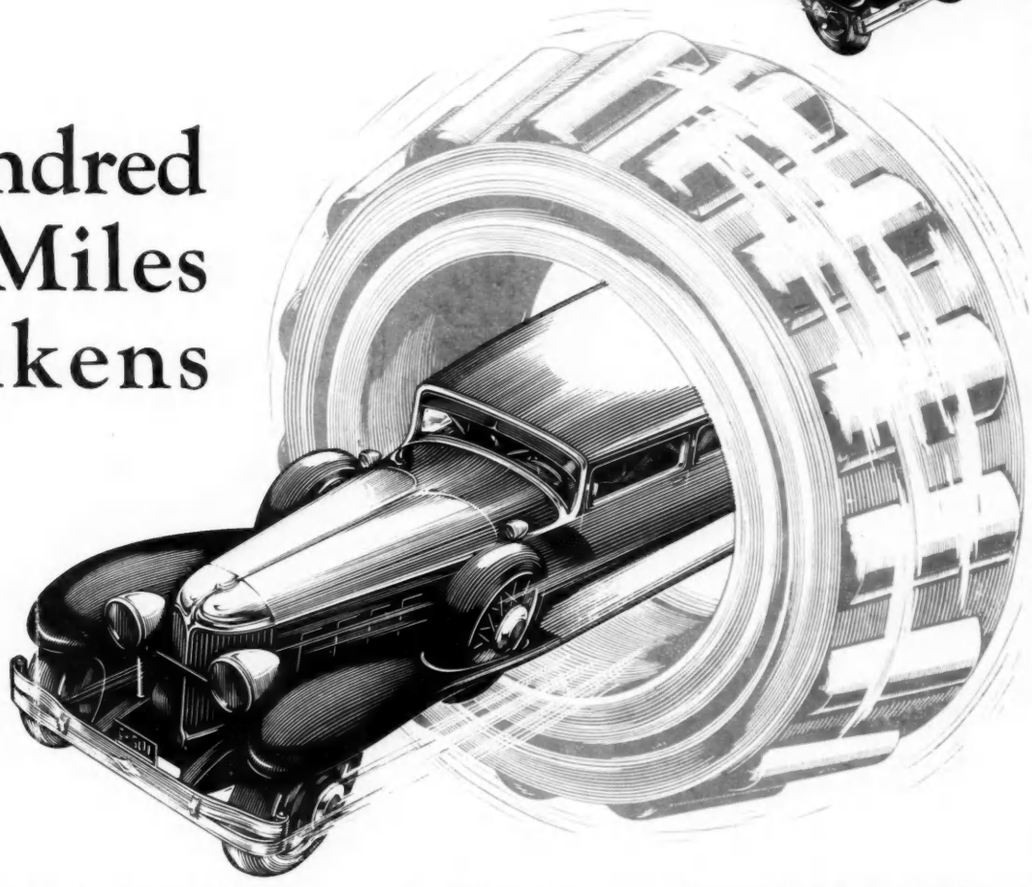


One Hundred Billion Miles On Timkens



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Production figures for "Timken Bearing Equipped" cars in 1930 alone show a total of 20 billion miles of owner driving as a most conservative estimate. Cars produced prior to that time, and still in service, multiply that figure by 5 or more—and a hundred billion miles a year is some driving.

After all—what are miles to Timken Bearings? Just opportunities to prove their superiority. Noiseless gears and shafts, dead silence in transmissions and differentials, effortless steering, true running wheels—these are the results of Timken tapered construction built to carry every type of load known to Transportation and Industry. Millions of automobile buyers use "Timken Bearing Equipped" as an infallible index to car life—and get years of carefree miles. The Timken Roller Bearing Company, Canton, Ohio.

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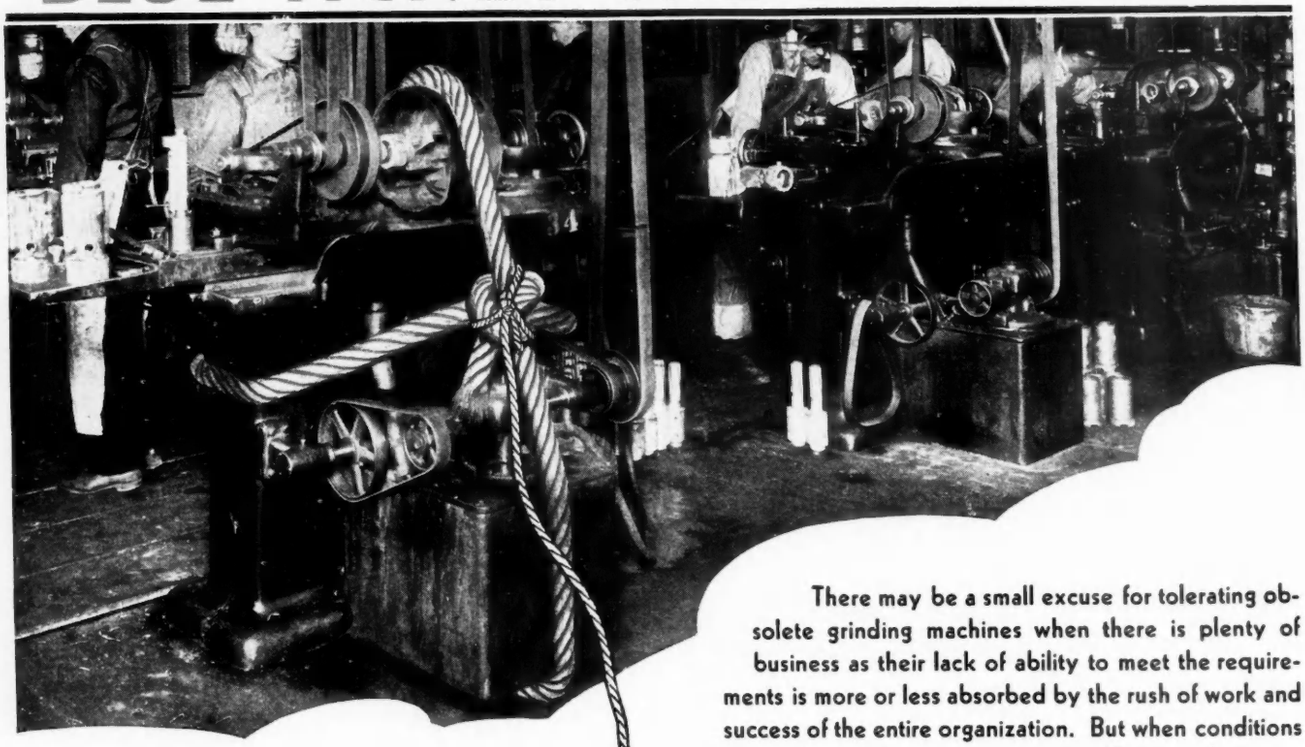

YOUR inefficient employees have long since received their blue tickets. But did you stop there? Did you check your equipment and tie a *blue ticket on the slackers*?

Every machine is an employee whose wages go on in spite of a small amount of work and short hours. If your tools do not rate high when compared with modern equipment, here's where a real saving can be made . . . here's where a replacement means profit — not expense. This is particularly true of grinding equipment on which unusually important improvements have recently been made. These not only increase production but cut the scrap.

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Reg. U. S. Pat. Off.

Vol. 64 No. 13

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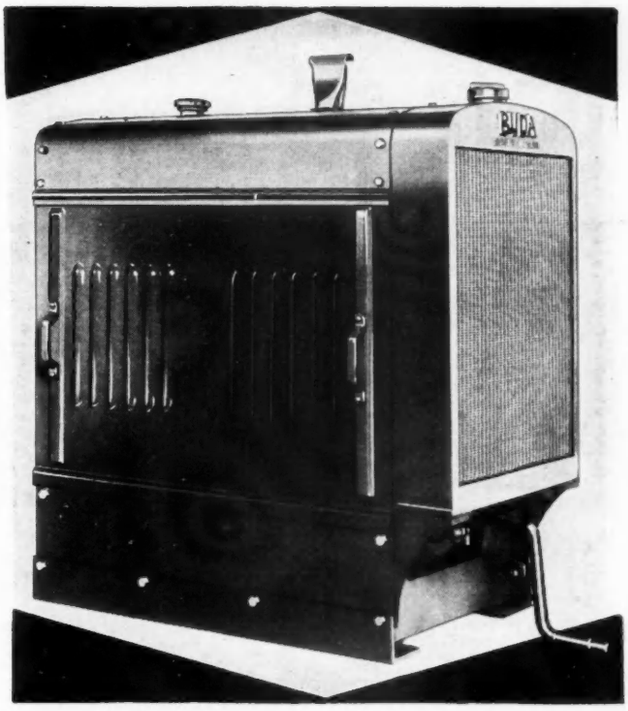
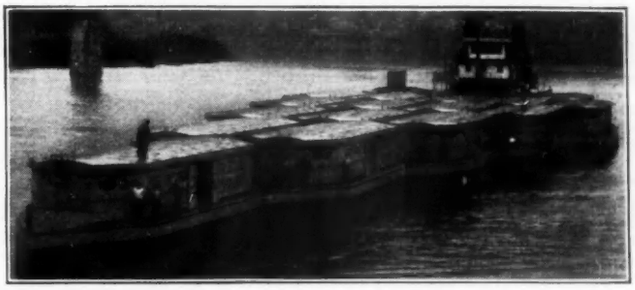
"Down to the Sea"



ONE of the newest of Young radiator applications is the task of cooling Buda Hivelo engines on the generating units of the tow boats of the Gulf Refining Company. Down in the hold, where there is no relief for bad air conditions, with room temperatures as high as 130 degrees, these radiators are required to cool the engines under the most adverse conditions possible.

This is just another convincing demonstration of the certain efficiency of Young designed cooling units—of the rich background of practical experience, of the exhaustive laboratory work that Young applies to every cooling problem.

Fine quality radiators for buses, trucks, tractors, power units, and all types of cooling installations; backed by a guarantee of satisfaction.



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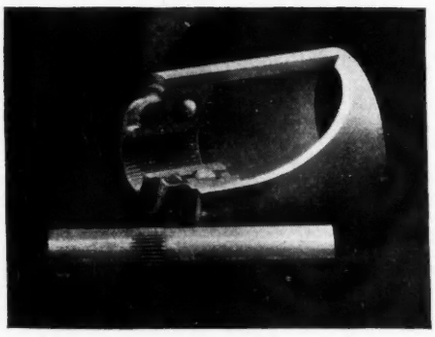
YOUNG RADIATORS ARE USED WHERE THE GOING IS TOUGH

Uncover those tell-tale handling figures

Electric ranges are heat tested as they move over a pallet section of the Mathews Conveyer System in the Edison G. E. Plant

IT'S ten to one you will never know what your handling costs totalled last year—whether or not your plant was one of the thousands in which the cost of *inside* handling practically equalled the entire cost of moving finished products from shipping platform to their markets. The figures are in the books, no doubt, but so hidden that the world's best statistician could never sift them out. This month, this year, however, can be made to tell a different story. Tabulate handling costs in their own column. Study them just as you would a plant production record. It's twenty to one you will recognize the need of improved methods—of a modern conveyer system engineered to bring about more speedy, economical handling. That system, if you would have maximum conveying efficiency, at minimum cost, should be a Mathews Conveyer System.

Only Mathews has the Gearlock Cone and Axle—In ordinary roller conveyer, used as gravity carrier or as the bed for belt sections, movement between the bearing cone and the axle often occurs when shock and weight have loosened the connection. This lost efficiency is impossible in Mathews Roller Conveyer because of the patented



gearlock cone and axle which firmly unite these two parts, yet permit easy detachability. This modern feature is clearly pictured in the cutaway illustration of Mathews Type 52A Bearing shown at the left. The axle is knurled, the inside of the cone accurately broached, thus providing a very simple, yet most positive lock.

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AUTOMOTIVE INDUSTRIES

VOLUME 64 MARCH 28, 1931 NUMBER 13

Automotive Sales Responding to General Business Increase

by Leslie Peat

SPRINGTIME, 1931, brings considerable optimism with it for automobile dealers throughout the country.

Reports from the major marketing areas indicate:

1. General business conditions have improved steadily;
2. Larger net profits to dealers are in sight; and
3. Enthusiasm for the new models of car manufacturers continues.

Immediate response to buying was felt in a number of areas as soon as the cold weather broke up, permitting the extensive construction plans throughout the country to begin.

Along the Pacific Coast retail sales have felt the effect of the beginning of the 1931 highway construction program. Government projects have stimulated buying. In other areas and cities such as Cincinnati, St. Louis and Chicago, the inauguration of large private enterprises is evident.

Public utilities are expanding their large new construction programs in many parts of the country. Large cash surpluses have been levied against to continue promises of activity made to the President last winter.

Between one-fifth and one-quarter of the population of the entire country depends in whole or in part on the building industry, and for this reason the revival of construction activity is being felt by car dealers.

In considering the prospect of automobile retail sales during the next quarter, weather and crop conditions are highly important. Beyond the immediate

Second Quarter Sales Outlook is Brighter

How Dealers Reported

	First Quarter Sales	Second Quarter Outlook
New York	Fair	Fair
Boston	Good	Good
Springfield	Fair	Fair
Philadelphia	Good	Good
Baltimore	Fair	Good
Washington	Good	Good
Cleveland	Good	Good
Cincinnati	Fair	Fair
Louisville	Poor	Poor
Toledo	Good	Good
Detroit	Fair	Good
Indianapolis	Poor	Fair
Chicago	Poor	Fair
Minneapolis	Fair	Good
St. Louis	Fair	Good
Dallas	Fair	Good
Denver	Poor	Poor
Salt Lake City	Poor	Fair
Oakland	Poor	Fair
San Francisco	Poor	Fair
Seattle	Fair	Good
New Orleans	Fair	Fair
Kansas City	Fair	Good
Milwaukee	Poor	Fair

effects of the summer and fall drought on crops, the adverse condition upon ranges, pasture lands and the next season's planting was extremely disappointing.

Throughout the Northwestern States, where early reports were highly pessimistic, conditions have been better, so far as the weather is concerned, than they have been in the Southern, Southwestern and some of the Prairie States. As a result the winter wheat crop in the Northwest has fine prospects at this writing. The farm value of crops reaped in 10 of these states showed less decrease than the slump in the value of total United States crops as of the end of February.

Heavy rains along the Pacific coast and unusually abundant snowfalls in the mountains assure good spring crops. Throughout the Middle West the weather has been comparatively favorable, reports indicate.

Business is Stepping Up

Throughout the country industry generally is swinging into a faster tempo. Reports from New York and the surrounding industrial centers indicate a healthy upturn as the first quarter closed. The Pittsburgh and Monongahela Valley industries have started an upswing in activity, although employment has not increased in western Pennsylvania and northwestern Ohio, as was predicted by industrial leaders.

Retail sales have responded to the passage of the veterans' loan bill, a number of correspondents report, and particularly in smaller cities immediate stimulus to new car registrations have been felt.

Automobile manufacturers have been stepping up production schedules during March, according to the automotive division, Department of Commerce. Reports to the division indicate that March production will probably be the highest since July. The February output was well above the previous month and continued the steady upward trend in output since November.

New car registrations in recent weeks have exceeded expectations. Shipments have been for immediate consumer delivery. This factor is believed to reflect a somewhat more active market situation and suggests the development of a helpful spring demand.

In spite of unfavorable weather in the New England States, both new and used car sales in **Boston, Springfield** and other centers have been above expectations. Until last week weather in Boston was the worst for 30 years, but business in this area was generally better than for the corresponding period of 1930. Dealers look for better sales during the next three months.

According to our correspondent, Ford dealers say the main reason that their sales have been off is that there is nothing new to offer.

Dealers throughout New England have been successful in their drives to clean up used cars. Used car stocks are about 25 per cent lower than at this time last year. Repossessions are running about even with a year ago, which was not excessive.

Our reports from **Springfield** indicate that the high-priced cars, despite the continued depression, have been making a far better showing than medium-priced automobiles, with Pierce-Arrow business ahead of any February in history.

In the **Greater New York** area both new and used car sales have been larger than were expected, although slightly off as compared with the first quarter of 1930. The spotty revival of industrial activity and general increase in retail sales indicate a better second quarter for automobile dealers.

Dealers in **Philadelphia** and adjacent cities have benefited from fine spring-like weather as the first quarter closed. Scores of dealers report that their floor salesmen have been busier than usual with customers "who just dropped in." The outlook for increased second-quarter sales is very good in this part of the country.

Dealers in the **Cleveland-Akron-Northeastern Ohio** area are looking forward to a continued improvement in business, and expect used car sales to show a steady climb during the coming months. February was beyond their general expectations and March has opened up with increased activity.

Cleveland automobile dealers are decidedly optimistic as to the outlook for the second quarter.

Although general business showed an improvement late in March, first-quarter new car sales were considerably under normal. Dealer profits were probably between 5 and 10 per cent under last year's figure. Large construction programs, however, have injected considerable optimism into the second-quarter outlook.

Ford sales will account for about 28 per cent of the first-quarter sales in the **Cincinnati** area, with Chevrolet running a close second with about 23 per cent. Ford dealers report that their increased discount is having little effect in maintaining their lead over their competitors.

Prospects for the second quarter in **Louisville** were somewhat brighter, although first-quarter sales were off. The continued industrial depression, bank failures and bad crops have resulted in considerably decreased dealer profits. Chevrolet sales are exceeding Ford sales in Louisville just now.

Michigan is Improving

Detroit dealers expect an improved second quarter. Apparently the lower-priced class and cars in the upper stratum are crowding out the middle-priced group in this area. Although the new Ford discount has improved the feeling between dealers and their factory, it has shown no effect on Chevrolet sales. Employment and general business has shown improvement in most parts of the state, with **Kalamazoo** and **Battle Creek,** for instance, approaching normal.

St. Louis dealers are very optimistic over the second-quarter prospects and during the first three months of the year have shown more profit and larger sales than for the corresponding period of 1930.

Business throughout eastern Missouri and western Illinois has been generally improving, with sales of lumber, stone and other building materials slightly above normal. A number of clothing factories are working overtime.

Apparently the new Ford discount has not reflected in increased sales to date. So far this year Chevrolet has beaten Ford in this territory.

Minneapolis and **St. Paul** automobile dealers report better profits for the first quarter of 1931 than for the same period of 1930. The outlook for the second quarter is good, with business showing general improvement. In the area surrounding the Twin Cities, Chevrolet is leading in new car sales; despite the new Ford discount Ford sales are showing no

likelihood of overtaking Chevrolet registrations.

Kansas City dealers are in a much better financial position than they were during this period last year, with profits equal to the first quarter of 1929.

Dealers generally predict sales increases ranging from 10 to 25 per cent for the second quarter.

The new discount has increased the sales efforts of Ford dealers and in some cases has reflected in a decline of Chevrolet and Plymouth sales, but not exceeding 10 per cent. Used car stocks are smaller than last year at this time. With the opening up of public works and favorable agricultural conditions the outlook is decidedly better.

Southwest Prospects Brighter

Dallas new car registrations were from 10 to 12 per cent greater during the first quarter of 1931 than for the same period in 1930. New oil fields in several counties, better livestock range conditions and brighter outlook for fruit and general crops have been contributing factors. Reduction of overhead and decreased allowances for used cars will probably bring dealer profits above last year.

In spite of Ford's new discount policy, Chevrolet sales are in the lead in many Texas marketing centers. A number of Ford dealers have switched to Chevrolet.

Little if any change in the retail automotive situation during the second quarter of 1931 is anticipated by **New Orleans** dealers.

Generally speaking, sales of new cars appear to be only slightly off last year's record, about 5 per cent. Used cars make a somewhat better showing.

The new discount helped Ford dealers to get business, but did not exert enough influence to prevent a drop below last year. It seems not to have affected other low-priced cars appreciably in this area. The trend to Fords which came with the new Model "A" is now being reversed by customers who are buying Chevrolets.

The first of the year brought a rise for some firms which made January compare favorably with last year, but February went down, reducing the total for the quarter.

The general situation in New Orleans is more encouraging than in many other localities, and while the unemployment problem is serious, it and other attendant ills will probably disappear sooner here than in some other centers.

Colorado Farmers Face Price Cuts for Beets and Beans

Denver dealers had a poor first quarter and see little or no improvement for the next three months. Repossessions have been much higher than they were last year. Farmers throughout Colorado face severe cuts in the price of sugar beets and beans. Most of the farmers are said to be entering this year with heavy debts on last year's crop, and in many instances banks are refusing further help.

Dealer profits were much lower during the first quarter than for last year, although used car stocks are somewhat reduced. The decreasing price of silver has been ruinous to the mining regions of the state. **Salt Lake City** dealers reported that new car sales were off approximately 45 per cent for the first quarter of this year as compared with the same period of 1930. Repossessions are decreasing, although they have been numerous during the past year. Although the immediate outlook is not good, prospects for improved second quarter are fair. The new Ford discount was said to have little effect on sales of competing automobiles.

Seattle automobile sales have about held their own during the first quarter, and dealers as a whole are quite optimistic in regard to the second-quarter outlook. Dealer profits for the first three months of 1931 will be considerably below those of either 1930 or 1929.

Ford dealers generally feel heartened by the new increased discount and report that this policy has strengthened their position among their competitors.

Passenger car business in **Milwaukee** so far in 1931 is running about 30 per cent under the same period of 1930, but improvement is now noticeable. Dealers say it is becoming less difficult to separate the public from its dollars, and they note that people generally are becoming conscious of the big values represented by current car prices. The replacement market also is increasing. The real test is expected to come in May, which always is the biggest selling month of the year hereabouts.

General business, while slightly improved, needs to rise considerably. Rural business has been hit probably more than city business.

While the January improvement in motor car sales in **Indiana** was partly erased by a slump in February that carried totals downward about 500 cars, March shows excellent signs of registering almost a normal seasonal increase over February. Business at the present time is running about 60 per cent of the same time last year. The first quarter probably will be at about the same percentage figure or a little lower.

The prospect for the immediate future is for rather small gains, however, with an increasing rate that is expected to surpass 1930 totals by September and from then to the end of the year to approximate 1928 business.

The slow pace of trade through the first quarter of the year has caused observers to move the time of equaling 1930 figures from June to September.

Boost Expected From Dealer Campaign

Chicago and Cooke County report that sales have been 40 to 45 per cent off during the first quarter, but with a more favorable prospect for the second quarter due to a sales campaign to be launched by the dealer association. The Ford increase in discount has helped the Ford dealers somewhat to the disadvantage of the Chevrolet and Plymouth agencies.

With sales for the first quarter 60 per cent over the corresponding figure of last year and a considerable gain in employment in 50 plants the outlook for the second quarter in the **Toledo** district is exceedingly optimistic.

From **Washington** comes a report of a 15 per cent gain during the first three months of this year with most of the gain being made in the lower price field. Observers in the field do not see any indication of a let-down in sales and expect continued gains during the second quarter.

Conditions in the **Baltimore** territory have been considerably affected by weather conditions during the first three months of the year. Sales for the quarter were below those of the corresponding period of last year but sharp marked improvements were noted with favorable weather conditions. Prospects for the second quarter look promising with the advantage of the good weather.

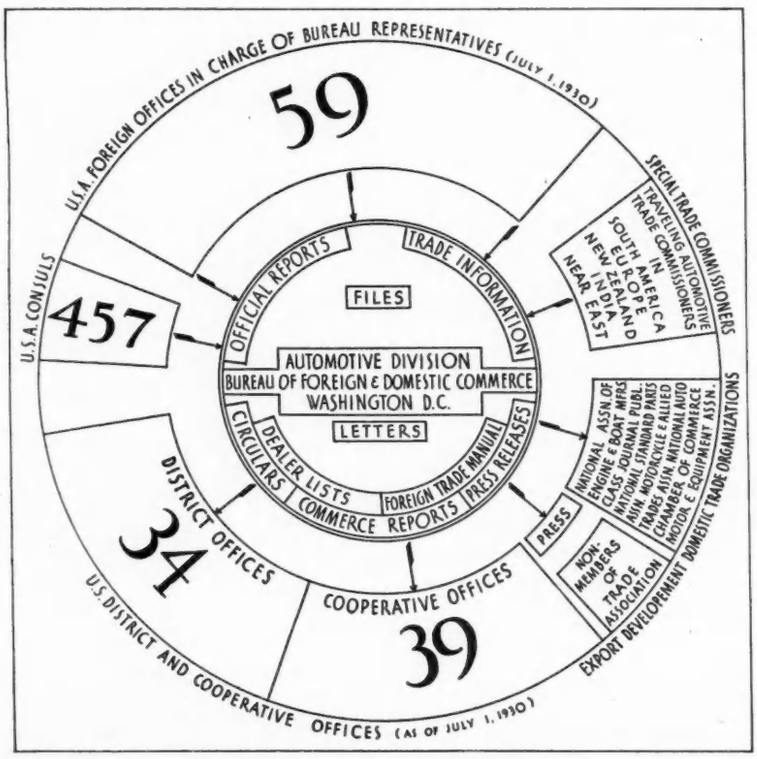
Even though thousands of eligible American firms and individuals are using the services of the Bureau of Foreign and Domestic Commerce to good advantage, it is undoubtedly true that there are still many who are not getting the benefit of the full range of services, due to lack of knowledge concerning the method of operation. For that reason this story is written

Automotive Products Promoted by

FOR the fiscal year ended June 30, 1930, the Automotive Division, Bureau of Foreign and Domestic Commerce, together with the domestic field offices of the Bureau, rendered exactly 283,065 separate and distinct services to exporters of American automotive products of all types and descriptions. This figure represents an increase of approximately 1500 per cent during the past decade, since the services rendered during the Division's natal year numbered only 17,000. To explain the many forms of assistance given, mostly gratis, means a story of the Division's functions, and to outline those activities it is necessary first to present a brief picture of the organization of the Bureau as a whole.

General Organization of Bureau

As will be seen from the attached organization chart, the Bureau of Foreign and Domestic Commerce consists (1) of its Washington headquarters, from which point the Director and four Assistant Directors control activities of the staff at home and abroad. Under them is organized a group of well coordinated service divisions, both commodity and technical, directed by practical men of intimate first-hand knowledge of the problems which confront American exports to foreign lands. Automotives thus fall within the former group of divisions. (2) In order that there may be a constant flow of important facts and figures for the use of those interested in overseas trade, the Bureau has established 59 foreign offices in the capitals and leading commercial centers of the world. Working under the direction of the Automotive Division are five special Automotive Trade Commissioners, who travel considerably and make reports of a specific nature. (3) In addition to the Washington headquarters and foreign offices, 79 district and cooperative offices are maintained in the industrial centers of the United States. These are the service stations of the Bureau organized in order that information gathered overseas and forwarded to Washington headquarters may be more expeditiously disseminated to American firms and individuals. One district office manager, whose name comes to me at this moment, is largely responsible for the satisfactory export volume, during recent years, of a rather important automobile company.



From the Washington headquarters valuable information is collected and distributed under the guidance of the director and an efficient staff

General Functions of Bureau

The Bureau is essentially a fact-finding organization not given to making business predictions. It concerns itself chiefly with the collection and dissemination of information relating to foreign markets and with the investigation of certain phases of domestic commerce which usually treat of distribution problems and the elimination of waste. Much assistance is rendered American firms interested in foreign trade by supplying them with market surveys; data concerning nature of competition and methods of meeting it; sources of supply of

By A. W. Childs
Chief, Automotive Division
Bureau of Foreign & Domestic Commerce

Federal Government

materials, especially raw products; tariffs and customs regulations; commercial laws; shipping and financing, and a great many related subjects having to do with selling conditions overseas.

In only a few of the countries of greatest commercial importance has it been possible or economical for automotive manufacturers to maintain their own staffs permanently. In most cases they depend largely on the data and advice from representatives of the Departments of State and Commerce stationed throughout the world. Even where manufacturers have their own representatives, the latter often are unable, for various reasons, to obtain the complete information which is usually available to the impartial representatives of the United States Government.

The Automotive Division is one of the specialized commodity divisions operating in the Bureau of Foreign and Domestic Commerce headquarters in Washington. It serves all branches of the automotive industry. The Automotive Division was established in 1921, and since that time it has been in charge of men who have had both manufacturing and selling experience, and who were well informed on the domestic and foreign automotive industries and markets. The Division serves as a clearing house for firms interested in the automobile trade and as an aid to American automotive salesmen preparing to leave for foreign service. Directly or indirectly nearly 1200 American Government representatives overseas serve the Automotive Division and through it the American automotive industry. The chief and other members of the Division make frequent trips to the automotive centers in order to maintain close contact with the industry.

Inquiries Anticipated

The number of individual services of the Division would undoubtedly be much greater had it not been for the fact that hundreds of inquiries are anticipated. When it is felt that the industry is particularly interested in a specific phase of trade, the Division prepares a questionnaire on the subject and forwards it to all of the Bureau's foreign offices and to consuls in countries where the Bureau is not directly represented. The Division always asks the appropriate trade associations to submit such questionnaires to their foreign trade committees for their comments. When the replies come back from the foreign field, a world-wide study is then made and given broad publicity through our own and trade publications, as well as the general press. If the subject is one of great general interest, the replies are compiled and printed as a separate booklet in the form of a "Trade Information Bulletin."

A. W. CHILDS

Important Trends Noted

In a study which the Division made recently of export conditions and figures, during a particular period of the 1930 world-wide depression, we, of course, noted at once that foreign shipments of automobiles declined perceptibly. Then we examined into our export trade in replacement parts and accessories, and found that they had not fallen off to the same extent as vehicles. We went a step further and made a study of exports of certain types of garage equipment and service appliances, and were not surprised to learn that such shipments had held up surprisingly well.

Buyers of automobiles in most countries have shown a preference for vehicles made in this country. These cars, trucks, and buses require service and it is only natural that the many countries will look to the United States for garage equipment to service their American vehicles. Another trend which was noted and brought out in the Division's export story for the calendar year 1930 was that the unit total of exports of trucks of greater than 1 ton capacity exceeded by 3300 the record total shipped abroad in 1929.

Establishment of New Services

The Automotive Division is constantly searching out new avenues of service to the industry, and improving

What They Are Doing

Type and Distribution of Material to Industry

Distribution to American automotive interests of the material gathered by the Division is effected through the daily press, trade papers and magazines, special circulars, letters to firms, statistical statements, trade information bulletins, the Automotive Foreign Trade Manual, and various other publications. There is no automatic distribution of the Division's trade data, except through the "Automotive World News." Sample copies of any of the services indicated below will gladly be sent on request.

Exporters' Index

The Exporters' Index is a classified list of American firms and individuals who are interested in the foreign trade of the United States. It is maintained in order that the more valuable type of information, such as may be converted into dollars-and-cents business, gathered abroad at Government expense, may be distributed only to American commercial interests. This list is carefully checked each year in order to record any changes, new firms entering the export business, amalgamations, withdrawals, etc. To obtain a listing on this index, the firm or individual must complete a form provided for the purpose, which gives evidence of the fact that the firm is American from the standpoint of capital control and direction.

Special Circulars

Whenever there comes to the attention of the Division a trade opportunity, the information concerning which is perishable, we immediately send out a special confidential circular to all firms handling the particular product who are entitled to receive that data. In order to become eligible for this service, it is necessary for a firm to get on the "Exporters' Index," which is explained above. Information such as the calling for bids on a certain contract for automotive vehicles or equipment, or road construction project, are handled in this way. Perishable data of this sort, received by cable, can be prepared in special circular form and be in the mail within three or four hours.

Automotive Foreign Trade Manual

One of the greatest single services of the Division is the preparation and distribution of what is known as the "Automotive Foreign Trade Manual," which now consists of one historical and five current volumes. Semi-looseleaf binders are used and from 50 to 80 pages, containing the most recent data and developments, are mailed out each week to the hundreds of subscribers. The Manual contains a fund of information most valuable to the automotive manufacturer or exporter. For each foreign country there are pages containing information concerning rates and bases for assessments of duties, consular requirements, customs regulations, automotive taxation, registrations by makes, packing methods, and other basic data such as population, topography, commercial languages used, area, type of government, currency, climate, favorable selling seasons, industries, chief imports and exports, types of roads, mileage, inland waterways, principal ports and prevailing economic conditions.

Commerce Reports

This is the Bureau's official weekly publication containing the world's commercial and economic news, notices of trade opportunities, cable and radio reviews, data concerning finance, tariffs, credits and collections, laws, transportation, etc., as well as foreign market information concerning a wide range

its existing services by changing their set-up or content to meet the ever-changing conditions in the trade. When an existing service has outgrown its usefulness, it is immediately discarded or revised to meet present-day conditions.

Application for Assistance

One branch of our work which has met with excellent results is through the use of a specially drawn-up form entitled "Application for Assistance in Securing Dealer, Distributor, or Indent Agent." That sounds a bit bureaucratic and likely to be bound up in much red tape, but fortunately this is not the case. When a firm comes to us and says it needs representation in Istanbul, for example, we ask them to fill in the form conscientiously, as it contains every important question and answer that might come up between our representative and a prospective dealer, thus saving much time, expensive cables, and letters. This form, together with the firm's catalogs, price lists, and other literature, is sent to our representative in Turkey, who immediately sets out in quest of a dealer. After thoroughly canvassing the market the Government representative boils down his recommendations to one or two specific dealers whom he believes best able to handle the inquiring firm's product. Along with these recommendations he transmits complete reports on their organizations, products handled, commercial standing, references, etc., for the final decision of the interested firm.

How Foreign Offices Collect Data

In addition to the several special Automotive Trade Commissioners, most of whose territories comprise several countries, there is in each foreign office of the Bureau an officer who has been designated to handle the automotive work of that office.

The officer who is assigned to handle automotive subjects establishes close personal contact with foreign Government officials, with all representatives in his territory of American factories, with distributors and dealers of automobiles and automotive products, with trade associations, trade journal organizations, and other automotive interests. He makes it his business to be personally acquainted with foreign merchants of automotive products and to know their capacity and reputation. With this knowledge, he is equipped to bring to their attention the trade inquiries from American firms requiring representation. These personal contacts also enable the officer to be of considerable help in the event of a misunderstanding between principal and agent. Through this direct association with companies selling American products, the officer acquires a fund of valuable trade information which contributes to the preparation of periodic and voluntary special reports.

Contact with American factory representatives provides another channel of trade information for the officer and gives him an opportunity to make available to the representatives a large amount of general commercial and economic data which is currently compiled and submitted to the Bureau by each foreign office. He is also qualified to advise the factory men, being familiar with local trade problems through residence in the country.

Contact with Government officials provides the officer with sources of registration, import and export statistics, highways data, and information regarding legislative enactments affecting the automotive trade, and many other forms of data.

In a similar way the hundreds of American Consulates throughout the world cooperate with American industry.

Returning Field Men Visit Industrial Centers

The automotive industry has encouraged the practice of the Bureau in arranging to have its foreign officers, upon their periodic returns to the home office, visit the more important commercial centers where they can have personal contact with those firms interested in exporting to the country in which they have been stationed.

Although the Bureau's foreign offices are always open to the American commercial traveler, it is suggested that a letter of introduction from the Director of the Bureau be requested for presentation to the officers in the field. The Commercial Attaches and Trade Commissioners are always ready and anxious to assist the traveling representative by planning and presenting, when requested, practical itineraries which will facilitate his operations and by making available data concerning the latest developments in the local market.

Calendar of Foreign Shows

The Division maintains a calendar of the principal foreign automobile shows, races, reliability tours, etc., and information concerning them is published quarterly in "Automotive World News."

Press Service

Through the inauguration of a special news service with the press, the foreign market news items of outstanding interest to special groups in the industry are classified and mailed to each trade publication whose circulation covers the interested group among the manufacturers and exporters. These foreign trade notes are published in the earliest issues and accordingly reach a large number of interested readers.

Production and Registration Statements

Each month the Bureau of the Census, Department of Commerce, publishes complete figures showing the production of passenger cars, trucks and buses, and taxicabs in the United States and Canada. Also, the Bureau of Public Roads publishes annually, by states, a compilation of total registrations of motor vehicles broken down into usual classifications. Passenger automobiles, taxis, and buses; motor trucks and road tractors; and motorcycles. This compilation also shows the number of tax-exempt Federal, state and municipal cars and motorcycles.

Loan Exhibits

A wide variety of material is prepared by the Division for loan, including detailed reports submitted in reply to questionnaires; items outlining an unusual development in some particular market; and sometimes even blueprints covering a foreign car, chassis, or some new and interesting automobile accessory, part, or tool. Notice of the availability of such exhibits is given in "Commerce Reports" and the "Automotive World News."

Suggestions Passed on to Field

In the many visits to industrial centers, made by the personnel of the Automotive Division, manufacturers of commodities. In this publication, a special section is devoted to automotive subjects. Here are published also important world surveys.

"Automotive World News"

Issued as a weekly release of the Division, this publication contains notices of trade opportunities and excerpts of cables reporting existing market and sales conditions overseas. Frequently it also contains registration and import information, and serves as a guide to the special services that are available in the Division. This goes out weekly to 2700 American exporters, manufacturers, bankers, etc. This service is gratis and a subscription will be entered upon request.

"High Spots"

This is another weekly publication which is devoted exclusively to hot-off-the-wire cabled data affecting sales of automotive products. It is prepared in telegraphic style, giving world happenings which may show an important market trend. No charge is made.

Statistical Statements

The Division issues monthly two statistical statements, one (Statement No. 7921) showing exports by country, number and value, of parts, accessories, service appliances, garage equipment, etc.; and the other (Statement No. 7900) showing the same data for cars, trucks, buses, parts for assembly. As of January 1, 1931, export statistics covering trucks, buses, and chassis, will be broken down into five capacity classifications, while passenger cars' statistics will be broken down into four value classifications. The cost of a subscription to either of these statements is $1.00 per year.

Commerce Yearbook

Published in two volumes, Volume I containing detailed information concerning business conditions in the United States and its noncontiguous territories and possessions, and Volume II containing similar data, though in less detail, for about 65 foreign countries.

Reporting Trade Opportunities

An activity of the foreign officers that produces direct and beneficial results to the automotive industry, and one which frequently can be measured by the dollars-and-cents yardstick, is that of constantly searching out and reporting on trade opportunities for the immediate sale of automotive products or the appointment of dealers or agents. References to these trade opportunities are published each week in "Commerce Reports" and the "Automotive World News." Reserved information, giving full details regarding the opportunity, is furnished to any duly listed firm or individual upon application.

Trade Information Bulletins and Trade Promotion Series

Whenever it appears necessary to present complete studies, permanent type, these are issued in the form of Trade Information Bulletins or Trade Promotion Series. The two forms of publication are similar in that they contain to a certain extent, non-perishable data, but the former usually is used when speed in publication is paramount and when the subject matter is not so long. Both are widely announced through Bureau publications, the press and trade associations. Typical Trade Promotion Series are "The Motor Trade of Great Britain"; "Automotive Market of Argentina"; "Automotive Market of Brazil"; while recent Trade Information Bulletins have been "The Motorization of North Africa"; "Automotive Market of Chile"; "Instalment Selling of Automobiles in Latin America," etc.

turers are asked to make suggestions as to how the Division's informational services might be improved. These suggestions are carefully recorded and after practically every trip, a list of new thoughts is sent to our foreign field officers for their guidance in order that they may know exactly the type of information which is of greatest value to the industry.

Special Conferences

Frequently when it is necessary to discuss important matters pertaining to foreign and domestic trade, the Chief of the Automotive Division calls the meeting at Washington or some more convenient point. These conferences are attended by representatives of the various branches of the industry especially interested in the subject of the discussion. Representatives of the Division also attend and take part in the programs of the more important conferences, shows, and conventions held by manufacturers, exporters and trade associations.

Specialized Technical Services

Many of the inquiries received from automotive manufacturers or exporters deal with questions which cannot be fully answered by the Automotive Division. In such cases, the resources of several technical divisions of the Bureau are available.

Results

In the above way and through letters, telegrams, and telephone conversations, the industry learns of many trade opportunities which are later converted into practical dollars-and-cents results. For example, as a result of contacts established by our office in New Zealand, a New York firm handling service parts has written to say that it expects to do about $150,000 worth of business this year. A Belgian dealer in automobiles, unable to secure satisfactory representation of an American car, was put in touch with an Indiana manufacturer, who has since placed the business done through this connection at $80,000. Through a foreign trade opportunity published in "Commerce Reports," a Michigan boat company received from Argentina orders totaling $100,000. Not so long ago, our Buenos Aires office informed the Division that the City of Buenos Aires had called for bids on motorized street cleaning equipment. The Automotive Division immediately sent out a special circular to manufacturers of trucks, and one prominent company was awarded a contract for 80 trucks. One recent trade opportunity, which, at the time of writing had not been closed, calls for the purchase of nearly 200 buses. Our Roumanian office recently assisted a prominent Baltimore manufacturer of electric drills to land a $10,000 order.

Suggestions to Automotive Exporters

Get your name on the Exporters' Index by calling on one of our District or Cooperative Offices. You will then be eligible to receive the Bureau's confidential circulars which contain valuable foreign trade information.

Subscribe for Commerce Reports, the Automative Foreign Trade Manual, Automotive World News, High Spots, Statistical Statements, and watch for notices concerning the issuance of Trade Information Bulletins. Any questions on any phase of foreign trade in automotive products which you care to submit will be answered to the best of our ability, and if we do not know the answer we will get it for you from the field.

If you plan to enter the foreign trade field, consult the nearest District or Cooperative Office, where you will obtain a supply of the forms, "Application for Assistance in Securing Dealer, Distributor or Indent Agent."

Very often, a firm or individual who is trying for the first time to develop a trade overseas will write direct to American Consular officers or representatives of this Bureau. This, however, is to be discouraged, as the Bureau and its District and Cooperative Offices usually have on file just the information you require.

The value of the Bureau's services to the automotive industry in the sales promotion of American automotive equipment increases proportionately with the use which the industry makes of these services. The Division is very much interested in extending and improving its informational services and welcomes any suggestions that the readers care to put forward.

Great numbers of members of industry are visiting the Division to acquaint themselves with the type and variety of material that is available for the asking. We have noticed that such persons make a good deal more intelligent use of the services than those who have not visited us.

A large part of the industry has learned, particularly during the recent period of general depression, that of necessity it must have more facts and rely less on hunches. As a result, much wider use has been made of the Division's facilities. With something over 36,000,000 (about 90 per cent American type) automobiles in use throughout the world, and considering the certain wheeled future of the nations, the replacement market alone, not to mention new owner demand for all things automotive, offers real possiblities, and in order to secure and retain the largest possible share of that market, it would seem to be to the advantage of every American company to have the benefit of all of the facts and figures collected.

Among the new services, established within the last few months or about to be started, are: (1) A monthly picture of the automobile stock situation in foreign countries. This will cover the various price ranges of both American and foreign vehicles, and will be based on cables received monthly from the foreign offices of the Bureau; (2) A world survey is now being made for the present and potential overseas market for American parts, accessories, garage and service equipment. Some of the replies have already been received; (3) Various studies are now being made parallelling the automobile and highway development in major sections of the world; (4) Recently material in export prospects for 1931 in 55 countries was sent out in the form of confidential letters to the entire industry. Much is heard and read concerning the general export situation, but little has appeared of a specific nature covering particular products by countries

Just Among Ourselves

Wind Tunnel Tests Questioned

WIND-TUNNEL tests and studies in connection with automobile body design are no longer a novelty.

Efforts to decrease wind resistance, even in stock passenger car bodies, have multiplied recently and give every indication of being redoubled within the next decade. Designers naturally have turned to the wind-tunnel for data and information to help them in this effort.

But just the other day we heard a man who has long been engaged in practical body research work express the opinion that wind-tunnel methods are not at all suitable for automobile body research.

Is somebody going to take the wind out of wind tunnels?

Well, we don't know but this expert's line of argument sounded mighty interesting. The wind-tunnel, he argues, does not reproduce automobile operating conditions and is entirely too sensitive for automobile purposes. While the wind-tunnel is excellent for aircraft work, he believes, passenger car operating conditions are not so readily reduced to formulae.

The Wind Does Shift, You Know

THE automobile, he points out, is seldom subjected to a direct head-on wind condition such as occurs in the wind-tunnel. Wind striking an automobile body usually comes at an angle and tends to strike the side rather than the front.

The effect of a side wind, of course, introduces a strong element of instability, and this expert feels very strongly that an absolutely streamlined "teardrop" type of body might be quite unstable and develop poor roadability at high speeds under side wind conditions.

"Polarized" Pull to Florida—Yes?—

A GROUP of hard-working passenger car engineers trekked up into Canada a month or so ago, so the tale runs, for the purpose of making some cold-weather driving tests. Having arrived there, they began waiting for the weather to get cold. After occupying themselves thus for about a week without having seen anything that looked like zero weather, they received a wire from their chief who was investigating conditions in and about Miami at the time.

"Should have come to Florida for tests," said the wire. "Plenty of cold weather here."

(EDITOR'S NOTE: We heard this story informally—it was not a publicity release from the Florida Chamber of Commerce.)

Let's Get Back to 1924 from Now

WE just printed an article entitled "3000 Legislative Bills Menace the Truck Industry." Today we were running through an old index of *Automotive Industries* and were startled to find that we had written an article in May, 1924, entitled "Motor Vehicles Fare Well in 1924 State Legislation." The titles of the two articles reflect rather accurately, we believe, the change which has come about since 1924.

Driven by love of reminiscence and curiosity we checked up that old article and were even more startled to find that at that time we were able to write the following: "Taken by and large the state assemblies seem to have adopted a far more sane view of the automotive industry and the automobile driver than has been their custom in the past. Most of the bills turned out this year (11 legislatures met) apparently have been based on a desire to give fair play to both the industry and the public. With one or two exceptions there has been no exhibition of direct hostility to the automobile."

O Tempora! O Mores!

The Cheapest to Buy And Costliest to Get—

"THE commonest article of commerce is misinformation about fundamental things," according to Franklin Hobbs, director of research, Girard Trust Co. of Chicago. So he told a group of machine tool distributors in a speech last Jan. 9.

We, for one, are not prepared to dispute his statement.

—N. G. S.

Increased Compression Ratio May Solve Problems of Compression-Ignition Engines

by Robertson Matthews

THE regulation of the timing of compression-ignition has received about the same amount of attention as did the control of detonation twenty years ago. When it comes to starting an engine on compression-ignition, an adjustment of the timing mechanism corresponding with that of spark ignition is not yet among our engineering accomplishments. Compression-ignition involves a different set of considerations from spark ignition, and among these, that of the timing of fuel injection is but a part.

Whereas, with large engines, both available space and operating conditions permit the application of auxiliary starting equipment, such as temporary hot spots externally heated, and temporary spark ignition, and preheating of the air charge, automotive engine conditions do not well lend themselves to such lines of development. Furthermore, though a rush of turbulent, fresh combustible gases across the terminals of a spark plug may even help insure positive ignition, such turbulence may be undesirable while starting on compression ignition with a cold piston.

Not only may the turbulence tend to break up a hot core of gases that should present the nucleus of an ignition zone, but, owing to the small size of the engine cylinder, little of the compressed air may escape washing heat of compression into the metal walls. For though air is one of our best insulators, it remains a fact that our best known method of making it give up its heat, other than by making it do work, is to sweep it across metal surfaces. Hence though, during final combustion, turbulence may be highly essential as a means for improving the intimacy of the fuel and the oxygen, turbulence can also, during incipient ignition, be the means of causing too great intimacy between the air and cold metal at the very time when it would be highly desirable to have the air and cold metal insulated from each other.

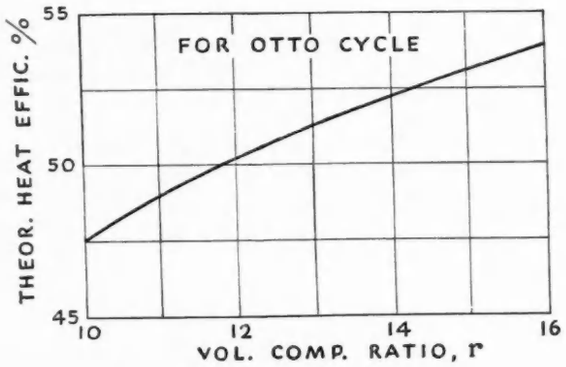


Fig. 1—Though the heat efficiency curve may appear attractive the greater maximum pressure is to be considered

While starting a cool engine it would seem, then, that three things are desirable if we are to have positive action in initiating ignition:

1. A minimum of either directed or other turbulence. The low r.p.m. while starting is an assistance in this connection, though to look for preservation of the air charge as a sluggish body after it has entered a cylinder in a funnel-shaped stream and passed one or more bends at high velocity, may be an exhibition of high expectancy. Of course, where there is directed turbulence, at least its partial annulment during engine starting may be readily achieved if the engine is of the sleeve-valve type.

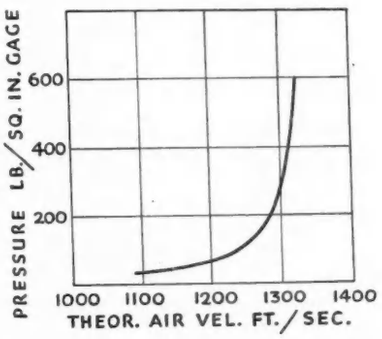


Fig. 2—The velocity of discharge of air for an ideal orifice as the initial pressure goes up and discharging against atmospheric pressure

2. Fuel atomization of almost excessive fineness is temporarily desirable. This fineness will prevent the spray penetrating to the metal walls. It will also insure a maximum of fuel area from which to provide the creation of an ignition nucleus of vaporized fuel. It will also provide a cloud of fuel some small portion of which can be thoroughly heated in a brief interval without the abstraction of appreciable heat from the contiguous air. Otherwise there might be required a higher compression ratio in order to make sufficient heat available for heating a much greater mass of fuel, or to provide that the ignition temperature exist throughout a greater mass of the mixture. Provision of an atomizer variable as regards not only its capacity but as a pulverizer, means increased development work.

3. Means for compensating for the effect of piston leakage on final compression pressure, and hence on final compression temperature. The relation between compression pressure and temperature is shown by the equation

$$\frac{T_2}{T_1} = \frac{\text{Final abs. temp.}}{\text{Initial abs. temp.}} = \left(\frac{\text{Final pres.}}{\text{Initial pres.}}\right)^{\frac{n-1}{n}} \quad \ldots (1)$$

Cold Starting

The relation of the exponent n to the final pressure is shown most directly by the equation

$$\frac{\text{Final pres.}}{\text{Initial pres.}} = \left(\frac{\text{Initial vol.}}{\text{Final vol.}}\right)^n \quad \ldots\ldots (2)$$

The initial pressure that prevails at normal loads will not be reduced when the engine is turning over at the slow r.p.m. But owing to air leakage the final pressure will be less the slower the piston speed, and especially with a fairly dry piston. Hence, because of air leakage, the final compression temperature will be less the slower the piston movement; and this at the very time when a maximum of compression with its generation of heat is desirable in order to offset the longer interval for heat abstraction by the cylinder walls. Both of these influences reduce the value of the exponent n for the compression curve.

Since the greater the ratio of compression the greater the expansion ratio and hence a better efficiency in the utilization of the fuel, it might seem that starting deficiencies such as leakage and cooling, could be taken care of by using an ample ratio of compression. To this end small engines have been built with a volumetric compression ratio r of 16:1 and over. These engines could start in zero weather with a regular automotive self-starter.

Though the theoretical heat efficiency curve of Fig. 1 may make an increase in compression appear attractive, against the gain in heat efficiency from a higher expansion ratio there is to be considered the greater maximum pressure—an approximate Otto card should usually be visualized—with all that that connotes respecting weight of metal, torque smoothness, and unit pressures on both big and small ends.

Furthermore, an increase in the compression ratio does not shorten the period of compression. But it does lend itself to an increase in the per cent of air leakage. Fig. 2 shows the velocity of discharge of air for an ideal orifice as the initial pressure goes up and discharging against atmospheric pressure. The rate of velocity increase falls off rapidly even before the pressure goes up above customary compression-ignition pressures. Since the cross-section of the piston-ring gaps does not vary with the value of r but with temperature, this leakage loss with a cool engine will probably vary more from a slowing up of the starting r.p.m. than from the increase in velocity of air due to the amount of pressure rise. With the engine cold, or at least cool, the piston ring gaps will be at a near maximum. The greater viscosity of the oil when cool may counteract in a measure this larger gap.

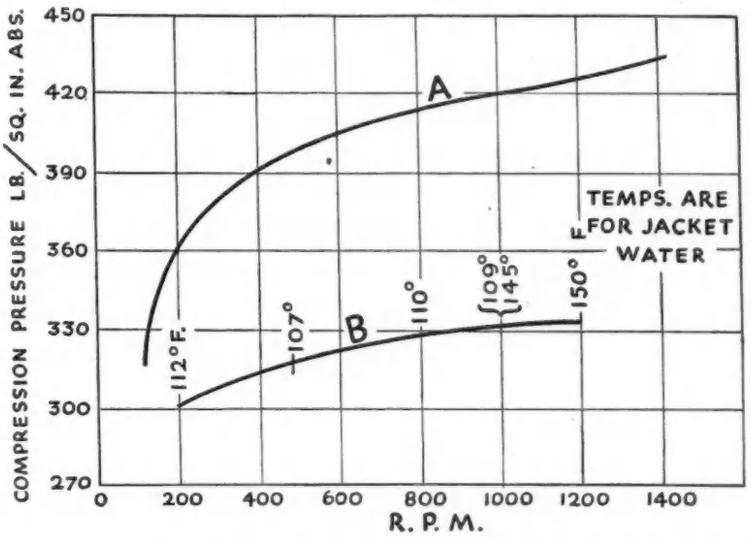


Fig. 3—Shows how the final compression varied with r.p.m. for two engines of 5-in. bore when motored over

The curves of Fig. 3 show how the final compression pressure varied with r.p.m. for two engines of 5-in. bore when motored over. Many influences enter, according to the engine. For A the compression ratio was 12.6:1. For B it was below 12:1. Curve A shows that below 400 r.p.m. the final compression pressure begins to take on an increasing rate of drop. This is of great significance in connection with an engine wherein ignition depends on pressure. To improve this condiition by the addition of more rings means a heavier piston and more friction. These are not attractive additions where the aims include high r.p.m. Curve B for a different engine and method of pressure measurement shows the jacket water temperature at the time of the pressure reading. Some temperature lag would naturally exist between the piston head and this water. The sides of the four rings for the B engine were carefully lapped in.

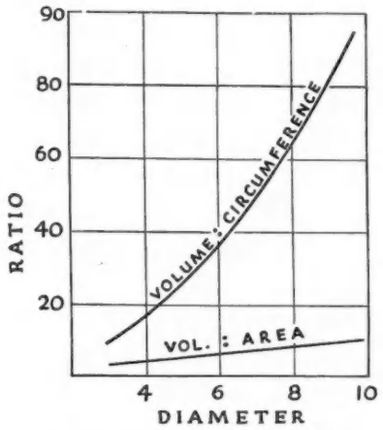


Fig. 4—The slopes of the curves above show how strongly a decrease in diameter may influence conditions essential to compression ignition

As regards the higher range of values in these curves, the difference in compression pressure with r.p.m. may not seem important simply as a comparison of numerical values, but the conditions represented may be highly significant, if not even critical, when associated with attempts to get low fuel consumption without excessive maximum pressures. Selection of a medium compression ratio suitable for normal load is no simple, detached problem when using small cylinders and variable r.p.m. and when the volumetric compression ratio is not a variable under mechanical control.

Consideration of provision of means to compensate for both air leakage and heat abstraction by cylinder walls, makes it of interest, for engines of automotive size in particular, to look at the manner

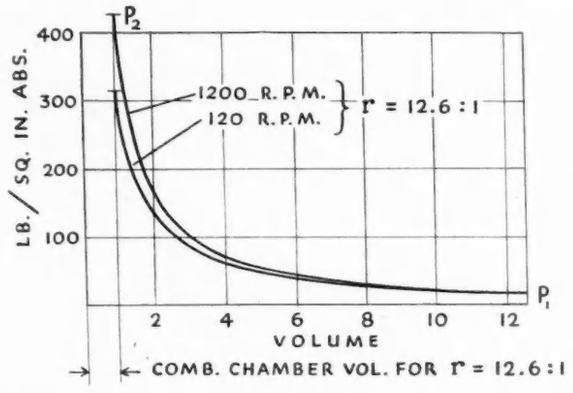


Fig. 5—Here are shown the compression curves at 120 and 1200 r.p.m.

in which the rate of leakage and heat abstraction can vary as the diameter of the cylinder is decreased. The ring leakage can vary directly as the piston circumference or cylinder diameter, but the volume of air supporting the leakage diminishes as the cube of the diameter. Similarly for heat abstraction, the abstracting surface decreases as the square of the diameter, but the available mass of air as a source or store of heat, decreases as the cube of the diameter. Hence for automotive sizes an inch of diameter may have a vital effect on the attainment of the necessary compression pressure. The slopes of the curves of Fig. 4 show how strongly a decrease in diameter may influence conditions essential to compression ignition.

From the foregoing the question naturally arises as to how mechanical design can be made to correct for starting conditions at present provided for by the preliminary use of spark plugs or the application of heat, both of which provisions do in themselves involve expense and complexity. Going back to equation (1), an electric spark, with ionization effects ignored, gives in effect a local instantaneous increase to the final temperature of the air. On the other hand, as regards the addition of heat as a means to achieve an essential final temperature this can be most effective by increasing the initial temperature of the air. The value of the exponent n for an actual curve, is affected by both the leakage and cooling conditions. There remain for consideration only modifications of the volume and pressure ratios. But, as stated above, a high compression ratio, something more than that required for the function of ignition at normal loads, is not desirable with an Otto heat cycle, and an Otto cycle seems largely inescapable as yet, when running at automotive r.p.m.

Changing Compression Ratio

Inherent mechanical design permits, however, an increased ratio of compression when *starting* and at light loads, and its reduction during normal running. Some foreign engineers have made such provision. By means of an auxiliary chamber of variable capacity the clearance volume, that is, the combustion chamber capacity, can be altered at will, and hence the volumetric compression ratio varied.

Presentations of the working of this auxiliary chamber seem as yet, however, to cover only mechanical details, whereas its possibilities can best be studied by first considering associated phenomena and the magnitude of the mechanical means and forces involved in the control of these phenomena. Such knowledge is the more significant since essential mechanical details are probably already covered somewhat widely by patents regarding which large commercial application is awaited with the usual opportunity for further development.

Items concerning the required variation in volume of an auxiliary chamber to take care of starting conditions and of the effort involved in manipulations, follow, and are based on curve *A* of Fig. 3. For the fuel available and the per cent excess air provided at normal loads, a compression pressure of not over, say, 425 lb. abs., is desired in order to assure positive operation and to restrict somewhat the occurrence of excessive maximum pressure.

Curve *A* is for a 5-in. cylinder. On this curve a pressure of 425 lb. abs. is reached at about 1200 r.p.m. and with the volumetric compression ratio constant and 12.6:1. For this analysis this ratio will be called 100 per cent.

In the absence of complete data the initial compression pressure will be taken as 14 lb. abs. at 1200 r.p.m. and as atmospheric, or 14.7 for this case, at starting r.p.m. The difference between these pressures is too small to show on a compression curve. The r.p.m. obtainable during starting can be widely variable. For this calculation it will be assumed to be 120. From curve *A* the resulting compression pressure at 120 r.p.m. would be about 315 lb. abs.

At 1200 r.p.m. the compression may, therefore, be considered to follow a path like the upper curve of Fig. 5. At 120 r.p.m. the lower curve may be taken as representative. From the curve of Fig. 6, based on the equation PV^n = a constant, the value of n for the upper curve is 1.35, while for the lower curve it is just over 1.20.

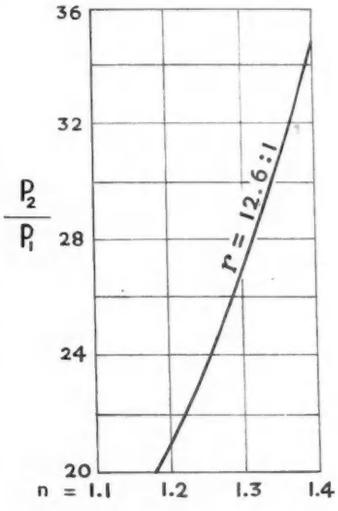


Fig. 6—The value of n would vary along each curve and the values given are average values which achieve the final pressures

In reality the value of n would vary along each curve, and the values given are average values which achieve the final pressures. It will be considered that this average value of n would hold at the given r.p.m. and wall temperatures even though the compression ratio varied somewhat.

On this basis the problem becomes, first, to find the required compression ratio in order that with an initial pressure of 14.7 lb. abs. and an average value of n of 1.20, the final compression pressure will be 425 lb. abs. Using the equation

$$r = \left(\frac{p_2}{p_1}\right)^{\frac{1}{n}} \qquad (3)$$

gives the necessary compression ratio of 16.5:1.

When r is 12.6, the proportionate values of the clearance or combustion chamber volume and of the piston displacement are 1 and 11.6. This makes the

clearance volume 1/11.6 or 8.62 per cent of the piston displacement.

When r is 16.5, the proportionate values become 1 and 15.5, and the clearance volume 6.45 per cent of the piston displacement.

The ratio of these two clearance volumes is 6.45/8.62 or about 0.75. This means that for the conditions of curve *A* and the chosen initial pressures the clearance volume during starting at 120 r.p.m. should be only about three-quarters of that at 1200 r.p.m. in order to give 425 lb. abs. compression pressure.

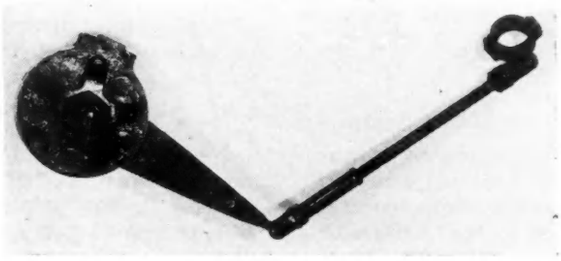
The difference in the amount of work of compression at 1200 r.p.m. and at 120 r.p.m. when r is 12.6:1, is represented by the area between the two curves. This difference is nine per cent of the work area for 1200 r.p.m. Evidently, the change of volume of the auxiliary chamber should be made to occur when the prevailing cylinder pressures are at or near their lowest values.

In order to avoid confusion it has not been attempted to show on Fig. 5 a compression curve from 14.7 lb. to 425 lb. with $n = 1.20$, nor the corresponding clearance volume for $r = 16.5:1$. Such a compression curve would lie slightly above the upper curve of Fig. 5 till reaching 425 lb. abs. Though the work of compression for this curve would therefore be slightly more than for the curve for 1200 r.p.m., the final temperature would be less because of the low value of n, only 1.20 for this particular set-up. The temperature at 425 lb. with $n = 1.20$ would be too low to ignite ordinary fuels when the air entered the cylinder cold, but the n at 120 r.p.m. could be higher with a change in set-up.

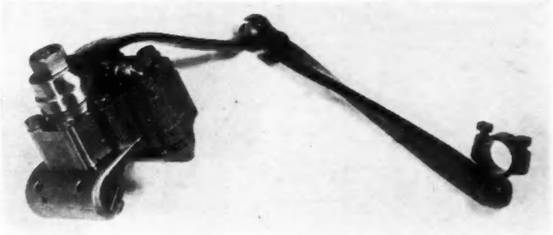
With the development of such an auxiliary chamber for aid in starting the compression-ignited engine, logical forward steps would seem to include its consideration as a sort of pep chamber for aeronautic engines at altitude, the additional weight being in part offset by the less weight necessary because of better control of maximum pressures.

With an engine arranged to have either more or less than what is chosen as 100 per cent clearance volume at normal load, a beginning is arrived at, at least in one direction, for regulation of the timing of compression ignition, a real essential to high-speed development and smooth operation at all loads.

Two New Shimmy Dampers Presented by Voges



Voges mechanical shimmy damper + + + +



Voges hydraulic shimmy damper + + + + +

TWO types of shimmy damper, one mechanical and the other hydraulic, have been developed by F. W. Voges, of Ozone Park, L. I., N. Y. The dampers are similar in principle to shock absorbers of the corresponding types. The device itself is secured to the front axle, while the link extending from its arm is clamped to the steering tie rod. Retarding forces produced by the mechanical friction of one set of disks moving over the other, or by a fluid being forced through a narrow passage, damp out any periodic vibration of the front wheels without, it is claimed, making the steering motion appreciably harder. With each device the retarding action on the front wheels is limited to an arc of 15 deg., or 7½ deg. to each side of the center position. If the wheels are deflected more than this, the damping action is entirely eliminated and the free action of the steering gear is not interfered with in any way. In the mechanical damper the friction plates are brought together and released by means of cams as the deflection exceeds and drops below 7½ deg. from the center position respectively, while in the hydraulic device there is an oscillating vane of considerable thickness, the outer edge of which is in close proximity to a raised ridge on the inner wall of a chamber of the form of a cylindrical sector. As long as the vane is opposite the ridge, the chamber is divided into two compartments, and any motion of the vane within this range is retarded by the friction encountered by the fluid while flowing from one compartment to the other through a restricted passage. As soon as the vane passes out from under the ridge the two compartments communicate through a wide opening, and the retarding force is removed. We are informed that patents on these dampers have been applied for.

U. S. Army Air Corps Switches from

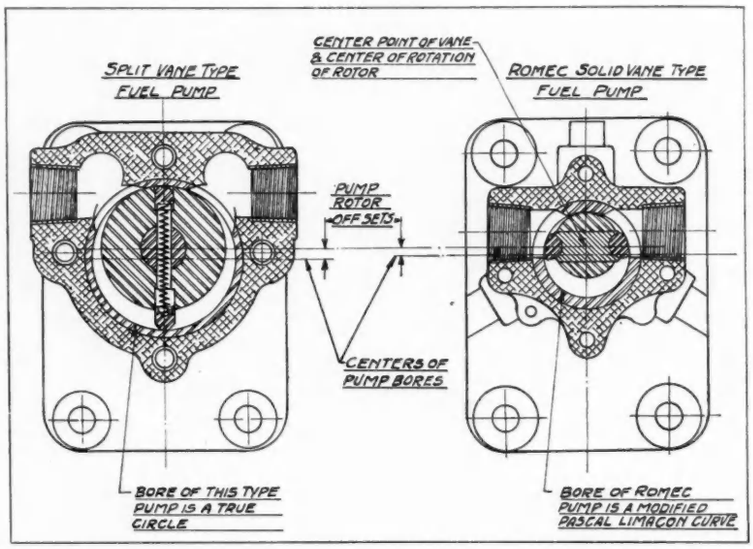

SPLIT VANE TYPE FUEL PUMP
CENTER POINT OF VANE & CENTER OF ROTATION OF ROTOR
ROMEC SOLID VANE TYPE FUEL PUMP
PUMP ROTOR OFF SETS
CENTERS OF PUMP BORES
BORE OF THIS TYPE PUMP IS A TRUE CIRCLE
BORE OF ROMEC PUMP IS A MODIFIED PASCAL LIMACON CURVE

Fig. 1—Comparison of split-vane type and solid-vane types of fuel pump + + + + + + + + +

This article, published by permission of the Chief of the U. S. Army Air Corps Experimental Section, gives an interesting and instructive outline of the development of fuel systems for aircraft in the government service + +

THE simplest fuel system for airplanes is the gravity feed system, in which the fuel tank, or tanks, must be located high enough above the carburetor inlet to maintain fuel flow to the carburetor at a sufficient rate to assure satisfactory engine operation under all normal altitudes of flight. This is very difficult to obtain, and as a result few Army types are so equipped.

Air pressure maintained by an engine-driven air compressor forced fuel to the engine in U. S. Army airplanes used during the World War, where the gravity system was not practical. The well-known DeHaviland observation planes, powered with Liberty engines, were equipped with this air-pressure system. A reserve tank mounted in the center section of the top wing fed fuel to the engine by gravity. On the LePere airplane a vacuum system was used, but it proved so unsatisfactory that it was replaced by wind-driven pumps. The dangers and hazards present with air pressure in the fuel tanks were recognized, and development of fuel pumps, which started near the close of the war, was accelerated after its end. A vane-type pump, driven by a flexible shaft connected to the rear of the engine and submerged in the fuel tank, where shaft-bearing leakage remained within the tank, was designed, built, installed and flown, but it was later discarded, the chief reasons being rapid wear of the fiber vanes and failures of the flexible shaft.

Next, the design of a four-cylinder "sylphon" pump was started upon, but this was discarded in favor of a two-cylinder "sylphon" design, better known as a Duplex Bellows pump, direct-engine-driven. This pump had "spring discharge," which was its big advantage, but it proved to be a source of trouble. A number of these pumps were built and put into service, but they

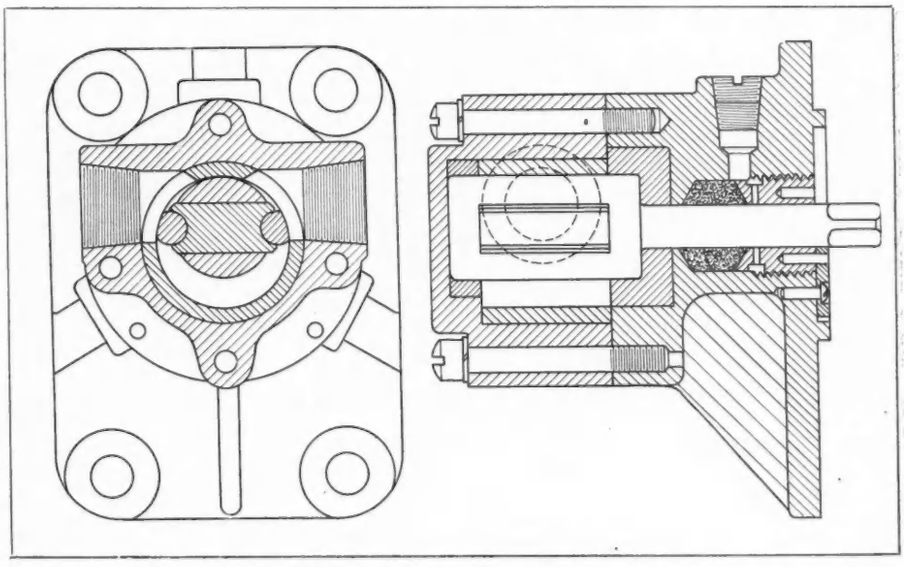


Fig. 2—Sectional views of Romec solid-vane type of fuel pump + + + + + + + + + + + +

Gear to Vane Type of Fuel Pump

by F. W. Heckert

Power Plant Branch,
U. S. Army Air Corps

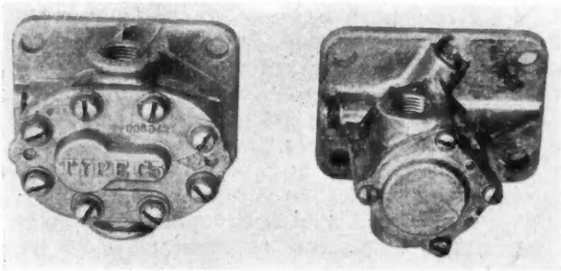


Fig. 3—Type C-5 and Romec vane type of fuel pumps compared + + + + +

left much to be desired. Failure of sylphons was a frequent occurrence. Its weight, large size, complication, pulsating discharge, and greater maintenance turned the attention of the Air Corps to a direct-driven rotary type of pump. A centrifugal pump was developed to be electrically driven, mainly for use on a large multiple-engined machine known as the Barling Bomber. Its use on this large plane was justified because of the large amount of electrical energy available for other purposes. A three-cylinder piston pump was developed by the Curtiss Co. and installed on its D-12 engines about this time. Other types of pump were developed by other organizations, but did not come into general use.

Development of the gear-type pump was started by the U. S. Army Air Corps in 1920. To start with, this type had the advantages of low weight, small overall dimensions, few (two) moving parts, and delivery in direct proportion to speed through a wide speed range. A direct-engine-driven pump had the advantage of greater power efficiency, increased output as consumption increased, less weight, no parasite resistance, greater torque and less maintenance. It was believed that the gear-type pump could be designed to prime, that it was easy to produce, was adaptable to all conditions of installation, easily maintained and inspected, could be run dry without lubrication, and that a satisfactory shaft packing gland could be incorporated in it. The development consisted of the design, construction and test of a few of each given design, followed by such redesign as was considered advisable after service tests.

In April, 1923, standardized drawings were prepared by the Air Corps of a type known as the C-5, and that same year production to meet the requirements of the Air Corps was started. This type is now the standard fuel pump of the Army and Navy Air Services. A larger-capacity pump, known as the type C-3, also has been standardized. Successful operation of these pumps is dependent on close machining tolerances and inspection, and on the exercise of unusual care to prevent entry of solid particles into the pump, which might cause scoring and "freezing," and lead to failure of the driveshaft. The gear-type pump possesses several disadvantages, chief of which are poor lift characteristics, inability to prime (except at low lift heads), and liability to "freeze" and score in case foreign particles get into it. Its low pumping efficiency is due to greater clearances necessary in relation to its total displacement than is the case with with a piston pump or a properly designed vane pump.

Up to the present, the vane-type pump has not proven satisfactory as a fuel pump, owing to design and material limitations. At the present time, the Air Corps is developing and service-testing an interesting type of vane pump submitted some time ago for its consideration. This pump is more familiarly known as the Romec pump, and is the product of the Martell Packings Co. of Elyria, Ohio. It was designed for use in aircraft along lines suggested by the Air Corps, as regards selection of materials, mounting base, shaft-packing means and inlet and outlet-port design. Fig. 1 is a comparison of the ordinary split-vane pump with the Romec. The basic design of this pump follows a patented solid vane construction controlled by the above-named concern, and is to be found in a line of

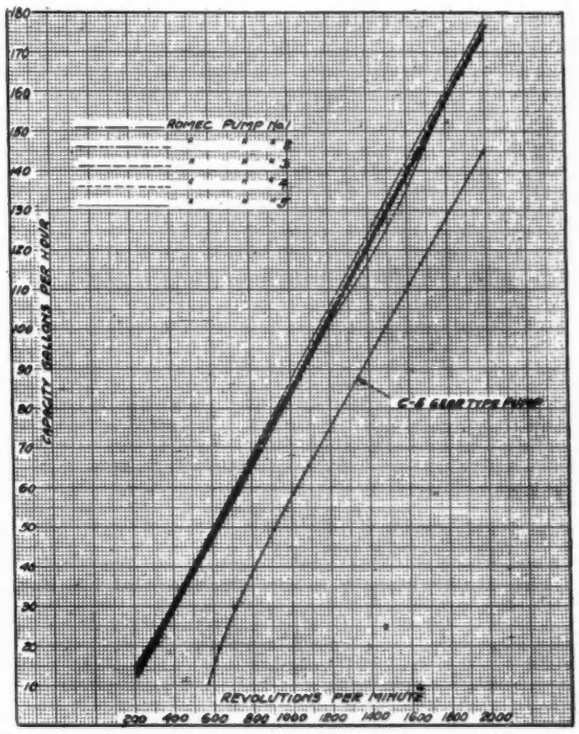

ROMEC PUMP No.
C-5 GEAR TYPE PUMP
CAPACITY GALLONS PER HOUR
REVOLUTIONS PER MINUTE
200 400 600 800 1000 1200 1400 1600 1800 2000

Fig. 4—Dependence of capacity of the two types of fuel pump on speed + + +

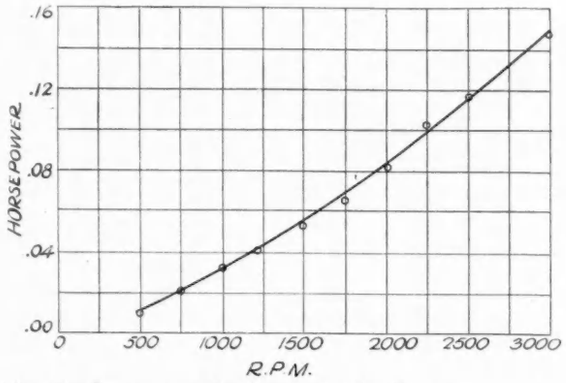


Fig. 5—Power required to operate Romec fuel pump at various speeds. (Suction-lift, 3.5 ft.; discharge pressure 5 lb. p. sq. in.)

pumps manufactured by it for various uses. Attention is called to the outstanding difference between this design and the conventional split-vane construction to be found in the usual vane pump. In the latter, each half of the vane is held against the bore of the pump body by one or more springs, and when rotating also by centrifugal force. The bore of the split-vane type pump is a true circle, which necessitates splitting the vane and spring-loading the halves. A solid vane will not maintain line contact with a cylinder bore throughout 360 deg. of motion when held in a slotted rotor eccentrically located. This can be understood by a study of the geometry of the two cases.

Fig. 2 gives a clear idea of the design of the Romec aircraft fuel pump. It will be noted that it is simple and well proportioned. Materials have been selected with an understanding of the conditions to be met in an aircraft fuel pump to assure efficient and reliable operation without attention over long periods of service. The pump operates equally well for both directions of rotation, and since its overall dimensions are less than those of the type C-5 pump, replacement of the latter by a Romec is quite simple.

A comparison of the relative sizes of the C-5 and Romec pumps may be gained from the photograph of the two pumps, Fig. 3.

Referring to Fig. 2, the Romec fuel pump may be described as a solid vane type with rocking contact blades oscillating in grooves at the ends of the solid vane, which maintain continuous contact with the developed curve of the pump body bore. The contact blades, or rockers, seal the vane against leakage. The combination of a rigid sliding vane, oscillating rockers, special pump body bore, or contour, and slotted rotor with integral shaft is peculiar to this pump, and represents an excellent example of the practical application of a modification of the Limacon of Pascal to a solid-vane-type pump.

The wearing parts of the pump, four of which are moving parts, are made of (Sumet) high-lead bronze, cast iron and nitralloy steel. The pump body liner of nitralloy is pressed into the cast-iron body housing, and bronze bearings are pressed into the pump body and base. Four 10-32 machine screws, 1¼ in. long, hold the base and body together, and a gasket at the joint seals against leakage. The 0.750-inch-diameter nitralloy rotor, mounted eccentrically, is slotted to receive the rigid vane of cast iron. The rotor and 0.312-inch-diameter shaft are machined from a nitralloy steel forging. The cast-iron vane is a sliding fit in the rotor, and grooves in the ends of the vane receive the rockers, which are made from hardened high carbon steel.

As the vane changes position from the vertical to the horizontal, the inflowing liquid fills the space within the pump bore remaining after the rotor, vane and rockers are in place. A definite amount of liquid is imprisoned in the pocket thus formed by the passing of the vane over the inlet port; further movement of the vane pushes the charge of liquid out through the discharge port. Gases as well as liquids can be pumped.

The capacity of the pump is determined by the length of the rotor, vane, pump-body bore, inlet and outlet port size. The port size and shape largely determine the volumetric efficiency. For a given bore and rotor dimension, variations in capacity can be obtained by varying the depth. The body-bore diameters vary at different points in the circumference to conform to the modified Limacon curve. The designed capacity of the aircraft fuel pump is 175 gal. per hour at 2000 r.p.m., 10 lb. p. sq. in. discharge pressure, and 10-ft. suction lift. The capacity drop of this pump at constant speed and suction lift and varying discharge pressures is very small, and a dry pump is able to prime itself at 250 r.p.m. from a suction lift of 3.5 ft.; and with the pump primed, it can maintain a pumping capacity of 15 gal. per hour at 200 r.p.m. at a 5-ft. suction lift and 5-ft. discharge head. The priming ability, both wet and dry, is unusually good for a vane type of pump. With the pump inlet line closed, depressions as high as 27 in. of mercury can be obtained with a wet pump running at 2000 r.p.m. This indicates high lift ability. The pump will run bone-dry for periods of one to two hours without damage.

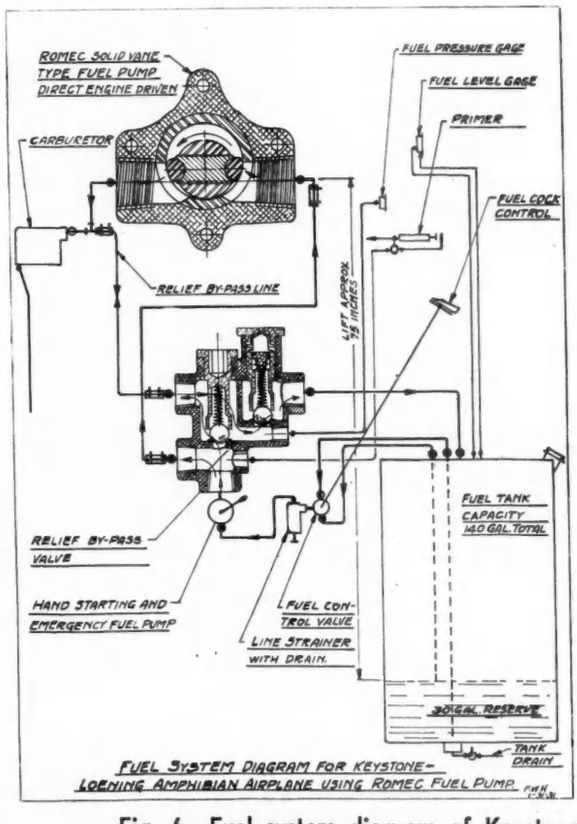

ROMEC SOLID VANE TYPE FUEL PUMP DIRECT ENGINE DRIVEN
CARBURETOR
FUEL PRESSURE GAGE
FUEL LEVEL GAGE
PRIMER
FUEL COCK CONTROL
RELIEF BY-PASS LINE
LIFT APPROX. 14 INCHES
RELIEF BY-PASS VALVE
HAND STARTING AND EMERGENCY FUEL PUMP
FUEL CONTROL VALVE
LINE STRAINER WITH DRAIN
FUEL TANK CAPACITY 140 GAL. TOTAL
SUPPLY RESERVE
TANK DRAIN
FUEL SYSTEM DIAGRAM FOR KEYSTONE-LOENING AMPHIBIAN AIRPLANE USING ROMEC FUEL PUMP.

Fig. 6—Fuel system diagram of Keystone Loening amphibion using Romec fuel pump

A sample pump delivered to the U. S. Army Air Corps, Material Division, recently completed performance tests and an extended endurance test which demonstrated the suitability of this pump for aircraft use. At the end of 3025 hours' running the pump was given a series of capacity, lift, prime and characteristic-performance runs, and it was found that its pumping capacity had increased approximately 5 per cent. The pump was disassembled and an inspection of the parts showed it to be in excellent condition and fit for further service without overhaul or replacement of parts.

Before the endurance test, check runs showed that this pump had a capacity of 149 gal. per hour at 3.5-ft. suction lift and 10 lb. p. sq. in. discharge pressure, and after the endurance test the output had increased to 157.4 gal. per hour under the same conditions of discharge and lift. The pump speed was held at 1725 r.p.m. At 5 lb. p. sq. in. discharge pressure the capacity was 161.5 gal. per hour.

The type C-5 gear pump has a capacity of 100 gal. per hour at 1700 r.p.m. and the C-3 delivers 170 gal. per hour at the same speed. These capacities are obtained at 3.5 ft. suction lift and 5 lb. p. sq. in. discharge pressure.

The pumping capacity curves of five service test Romec pumps (new) and a minimum-clearance new C-5 gear pump are shown in Fig. 4. The designed capacity of the C-5 pump is 100 gal. per hour, whereas the curve shows 120 gal. per hour. This difference is accounted for by the clearance tolerances allowed in the manufacture of the pump. Slight differences in clearances affect to a considerable extent the performance of the gear-type pump. Note the uniformity of the five Romec pump curves. Their performance becomes still more nearly uniform after the pumps have polished themselves in from some service operation. Note also the drop in pumping capacity of the C-5 pump at the lower end of the speed range. Aviation gasoline with a specific gravity of approximately 0.72 was used for the tests, and a constant discharge pressure of 5 lb. p. sq. in. was maintained. A curve of the horsepower required to operate the Romec pump when pumping gasoline under the above conditions is shown in Fig. 5. A pump in good condition with shaft packing gland of average tightness can easily lift fuel from a depth of 25 ft. at a normal pump shaft speed of 2000 r.p.m.

Priming and Suction Lift Data Romec Fuel Pump

R. P. M. Pump Shaft	Suction Lift In. Hg. Dry	Suction Lift In. Hg. Wet	Suction Lift Ft. Wet	Priming Time, Sec. 3.5 Ft. Lift Dry
250	1.0	4.0	4.0	13.5
500	3.2	6.4	6.4	3.5
1,000	8.0	15.0	15.0	2.2
1,500	9.0	22.0	22.0	1.5
1,750	10.0	24.0	24.0	1.0
2,000	11.0	25.0	25.0	.8

Experience with the C-5 pump shows that it tends to lose its prime at the lower engine speeds, especially when installed in a fuel system where the fuel supply is 3 ft. or more below the pump inlet. The Keystone-Loening, Fokker, Douglas and Towle amphibion types have their fuel tanks well below the direct-engine-driven C-5 pumps and experience difficulty in maintaining satisfactory fuel pressures at the carburetor.

The fuel system diagram (Fig. 6) shows a Romec pump installed in the fuel system of the Keystone-Loening amphibion airplane. The relative location of the units in the actual installation is shown when running on the reserve fuel supply. The suction lift is approximately 6 ft. Installation of the Romec pump in this case overcame the difficulties encountered with the C-5.

A rotary type pump along the lines of the Romec is more desirable for aircraft engines, and is preferred by the U. S. Army Air Corps because of its small size, simplicity, reliability, ease of installation, all around pumping efficiency, durability and small amount of power required to drive it.

The pump is now in use in Army Air Corps and Navy service airplanes and can be recommended for use in the fuel systems of other aircraft in which a pump is employed. The Martell Packings Co. also makes this type pump with relief and by-pass valves and strainer incorporated within the pump unit proper, thus eliminating a number of fuel line connections and requiring less fuel line tubing.

New Gear Ratio Gives Dodge Higher Top Speeds

RATHER than wait until time for a new model announcement, Dodge Brothers has, since the announcement of its new six in January, already added a number of improvements in these cars, making for further improved riding qualities, high top speed, and greater engine smoothness.

Perhaps the most important change is in the adoption of counterweights on the crankshaft, decreasing bearing loads for long life and imparting added smoothness to the engine.

In the rear axle two changes of importance have been made. The tread has been increased from 58 to 59 in. and final reduction gears have been increased in size, the ring gear now being 9½ in. in diameter, as against 8¾ in. formerly. At the same time new gear ratios of 4.60 to one on the sedan, and 4.30 to one on coupes and roadster have been adopted. Comparing this with the former ratio of 4.66 to one it will be seen that higher top speeds have been made possible, especially on the two-passenger models.

Front axle tread has also been increased, in this case from 56¼ to 57 5/16 in. While, as in the case of the rear axle, better roadability is thereby obtained, in the case of the front axle shorter turning radius is also made possible by this change, by permitting higher wheel angularity.

From a riding qualities angle increased length of the rear spring is also important, this being 55¼ in. now, as against 54⅝ in. formerly. A slight increase in flywheel face width contributes to longer starter ring gear life. In the cooling system a slightly smaller fan of somewhat higher rotational speed has been adopted, without sacrifice in cooling capacity. This makes for less horsepower absorption of this unit.

Two minor changes affect servicing operations. Spark advance is now set for 16 deg. at 2430 r.p.m. Castor angle tolerance for the front axles have been increased by permitting a castor of 1 deg., whereas 1½ was the former low limit. Camber is now also 1½ deg. instead of 2 deg. as formerly.

Steering gear ratio is slightly slower, 13.5 to one, as against 13 to one formerly.

Piston Rings Cast by Centrifugal. Modulus of Elasticity

Castings are easily machined with an ordinary high grade of high-speed steel at 45 to 50 feet per minute

THE British Piston Ring Co., Ltd., Coventry, England, who have a number of patents relating to centrifugal casting machines, have a foundry devoted solely to the manufacture of centrifugal castings for producing piston rings, cylinder liners, valve seats and brake drum liners for automotive requirements.

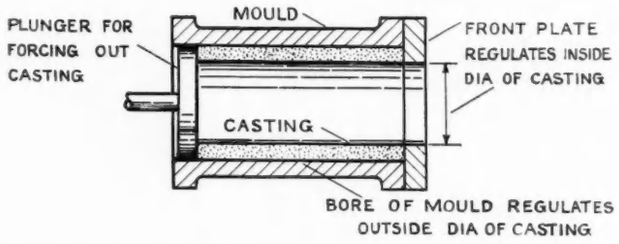

PLUNGER FOR FORCING OUT CASTING
MOULD
FRONT PLATE REGULATES INSIDE DIA OF CASTING
CASTING
BORE OF MOULD REGULATES OUTSIDE DIA OF CASTING

Fig. 1—Features of the mold used for centrifugal casting + + + + + + +

In the centrifugal process of this company a given quantity of molten metal is placed in a receptacle or container which is then revolved at high speed, thus setting up a centrifugal action by which the liquid metal is projected in an outward direction toward the interior surface of the container or mold. If the container or mold is drum-shaped, and is revolved about a horizontal axis, the liquid will spread itself evenly over the interior leaving a clear round hole through the center. Immediately the metal solidifies it is ejected from the container and the result is a tubular casting, the exterior of which conforms to the shape of the mold.

The features of the mold and the front-plate design are shown in Fig. 1, which indicates how castings of varying thicknesses can be produced. The machine normally used for small sizes is illustrated in Fig. 2, and a typical group of castings in Fig. 3. Two larger machines for producing castings from 6 in. to 14 in. and 14 in. to 30 in. diameter are also used.

As an example of the production obtained, the smaller machine is capable of turning out 20 to 25 castings suitable for 3-in. rings per hour, which is equivalent to 1200 per week of 48 hours, and from each pot from 30 to 40 rings may be machined, the actual number depending on the ring width.

The fact that the molten iron solidifies under considerable centrifugal pressure, and at the same time undergoes very quick cooling combined with a certain amount of agitation, due to the whirling action of the metal, results in a structure which is closer in grain than individually cast piston rings, and very much closer than ordinary cast iron. A very noticeable feature of centrifugally cast material is its high modulus of elasticity and non-liability to permanent set.

This in conjunction with its other mechanical properties renders it extremely suitable for piston rings.

The inclosed photomicrographs (Figs. 4 and 5) show the structure of centrifugally cast iron compared with a high-grade sand-cast piston ring iron at the same magnification.

The centrifugally cast iron produced conforms to the British Engineering Standards Association specification. Castings are free from chill except at the extreme ends; one end is ground on the surface for clamping in the chuck or face plate of the lathe, and the other end is parted off either before or at the same time the rings are turned.

The metal is taken from an ordinary type foundry cupola which can be run in stretches of eight hours without any difficulty. Two of these are installed, one being made up while the other is in use. Ordinary good class pig iron mixed with centrifugal or similar scrap in the proportion of say 60 per cent and 40 per cent is used. The castings are easily machinable with

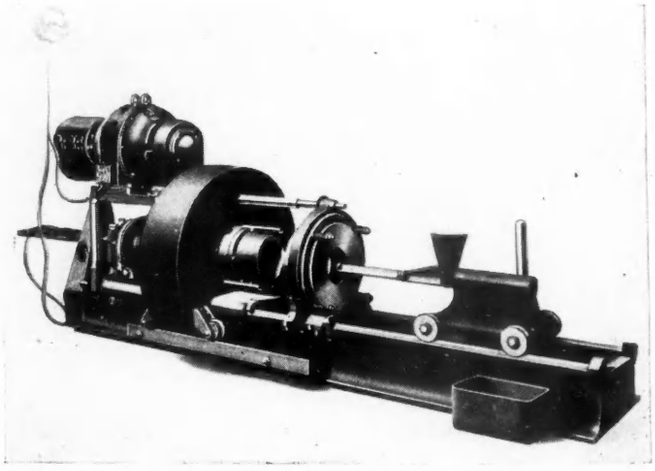


Fig. 2—Machine used for casting small parts

Process Have Close Grain and High

by William A. Oubridge

Managing Director
The British Piston Ring Co., Ltd.

Fig. 3—A group of typical small parts made by centrifugal casts + + + + + + + +

an ordinary high-grade high-speed steel at 45 to 50 ft. per minute.

Each day a percentage of the castings are analyzed and tested for mechanical properties, a well-equipped laboratory maintaining a close control at all stages from the raw material to the finished product. A most interesting point is that the tests for elasticity, transverse strength and permanent set are taken on the actual castings, the test piece being in the form of a roughly machined ring. This enables the mechanical properties of the actual castings to be determined, which is of course not possible when using separately cast test bars.

Cylinder liners are now being used to a very great extent in England, permitting the cylinder bore to be of specially close-grained material which is not possible in the ordinary cylinder block. They may either be used to bring back to a standard size a cylinder bore which has become worn, or they may be fitted in new engines so that when wear occurs it is only a question of renewing the liner.

While dry liners, that is to say, liners about 3/32 in. or 1/10 in. thick pressed in cast iron block of standard form, are at present mainly in use, wet liners which are much thicker, with collars which are a press fit into the corresponding portions of the cylinder housing, are also being adopted. Here the actual liner between the before mentioned collars is surrounded by water and serves as the water jacket. These have a great advantage from the point of view of heat conductivity over the dry liner but precautions must be taken to insure watertight joints between the liner and the cylinder housing. Wet liners enable the cylinder housing to be of aluminum or other light alloy, with the consequent saving of weight, which is of great importance in heavy commercial vehicle engines.

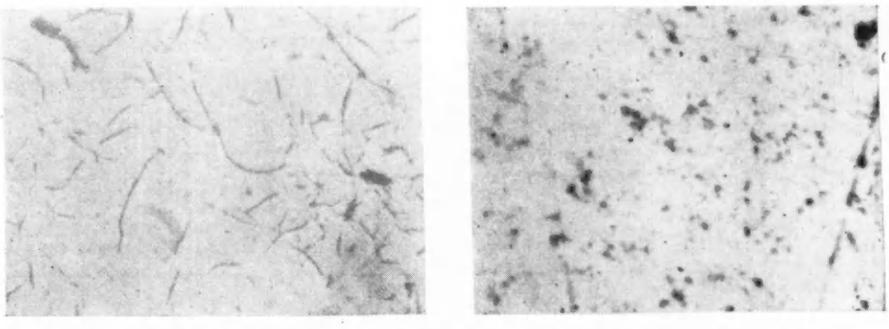
A more recent application of centrifugal castings is in the direction of brake drum linings, as it has been found that cast iron of the right composition stands up much better in service than any type of steel. Such liners are usually made 3/16 or ¼ in. thick, depending on their diameter, and are riveted in position after pressing in to the machined brake drum.

British Vehicles Using Cylinder Liners

The British correspondent of *Automotive Industries* has compiled the accompanying list showing the wide popularity of cylinder liners in the British market. The liners listed are the product of several manufacturers.

Name	Type of Vehicle	Type of Liner	Material	Treatment
A. E. C.	Buses and Trucks*	Dry	Cent., C. I.	None
Albion	Buses and Trucks	Dry	Nichrome, Cent., C. I.	Air hardened
Bristol	Buses and Trucks	Wet and Dry	Nichrome, Cent., C. I.	Air hardened
Crossley	Buses	Dry	Cent., C. I.	Air hardened
Dennis	Buses and Trucks	Wet**	Sandcast nickel, C. I.	None
Dennis	Buses and Trucks	Dry††	Sandcast nickel, C. I.	None
Halley	Buses and Trucks	Wet	Nichrome, Cent., C. I.	Oil hardened
Maudslay ...	Buses and Trucks	Wet	Cent., C. I.	None
Scammell ...	Trucks	Dry	Nichrome, Cent., C. I.	Air hardened
Sunbeam ...	Cars	Dry	Cent., C. I.	None
Star	Cars	Wet	Cent., C. I.	None
Vulcan	Buses and Trucks	Wet	Cent., C. I.	None
Lanchester .	Cars	Dry	Chr., Cent., C. I.	Oil hardened
Leyland	Buses and Trucks	Dry	Cent., C. I.	None
Thornycroft.	Buses and Trucks	Wet and Dry	Nichrome, Cent., C. I.	Air hardened
T. S.	Buses and Trucks†	Dry	Cent., C. I.	Air hardened
Bean	Buses and Trucks	Wet	Sandcast, C. I.	None

* Reconditioning only.
† To order only.
** On overhead valve engines.
†† On side valve engines.
Cent. = Centrifugally cast.
C. I. = Cast iron.
Nichrome = Nickel chrome.



Figs. 4 and 5—Photomicrographs comparing centrifugally and sand cast iron + + + + + + + + + + + + + + +

HOW'S BUSINESS?

TO BE NEXT MONTH

CHARTED BY UNITED BUSINESS PUBLISHERS, Inc.

THIRTY-FOUR ECONOMIC EXPERTS—EDITORS OF BUSINESS PAPERS PUBLISHED BY THE *United Business Publishers, Inc.* —HERE PRESENT A COMBINED OPINION ABOUT THE COURSE OF BUSINESS DURING THE MONTH OF APRIL. GOVERNMENT AND OTHER RECORDS PROVIDE YOU WITH HISTORY OF RECENT MONTHS. THIS BOARD OF EXPERTS DEALS ONLY WITH THE FUTURE. ITS OPINIONS ARE BASED ON CLOSE CONTACT WITH THE MORE THAN 400,000 SUBSCRIBERS REACHED BY THEIR PUBLICATIONS IN FAR FLUNG FIELDS OF RETAILING AND INDUSTRY.

WE are to a considerable extent dependent upon the good graces of Nature in April. Normal spring weather will do much to accent and increase seasonable business which, as yet, has shown no decided vigor.

In some of the larger merchandising lines, distress merchandise has been disposed of and, with freedom from dumping, store executives feel confident that retailing will go along normally and steadily with good prospects that unit sales will be slightly higher in money value.

Steel, while volume is considerably below normal, has an encouraging outlook; and if the optimism in the automotive field materializes, the second quarter in this latter field will show improvement, with a contributory benefit to steel and other lines.

Nothing spectacular in any line of business is in prospect; and with the closing of congress, politics passed from the acute to the chronic state, with less probable adverse influence on general business.

Increases in employment, though not so strongly emphasized in the press at present as those reported soon after the first of the year, are steadily being made. Confidence, based more securely on many small occurrences, rather than hopes pinned on some anticipated happening, seems to be mending, and April should see us moving gradually along the upward path.

THE COURSE OF BUSINESS FORECAST FOR APRIL

BUSINESS	SALES	RETAIL STOCKS	COLLECTIONS	COMMENTS
AUTOMOTIVE	Passenger cars 24% better in April than in March; trucks 14% better. Passenger cars 24% less, trucks 15% less than April, 1930.	Passenger cars slightly higher, trucks about same in April as in March. Both lower than April, 1930.	About the same in April as in March on both lines. Both slower than April, 1930.	Passenger car sales for April estimated at 280,000; trucks 40,000.
DEPARTMENT STORES	About same in April as in March but 5% lower than April, 1930.	Stocks 5% lower in April than in March, and 7% under April, 1930.	No change from March, but slight improvement over April, 1930.	With distress merchandise now cleaned up, unit sale should increase slightly in money value.
HARDWARE	April sales 5% ahead of March, but slightly behind April, 1930.	Increase of 10% over March, but 10% lower than April, 1930.	Will show some improvement over March, but slower than April, 1930.	Trade sentiment shows improvement and future being viewed with more optimism.
INSURANCE	Better in all lines in April, with life lower and casualty about same as April, 1930.	.....	Slight improvement in all lines over March, and also over April, 1930.	Life writings should improve, and automobile lines will be the big casualty producing unit.
JEWELRY	Will be generally better in April than in March, and same or better than April, 1930.	Same or slightly better in April than in March, but lower than April, 1930.	About same as March, and same or slightly slower than April, 1930.	Conditions in this industry are at last showing definite, if slight, improvement.
METALS METAL PRODUCTS MACHINERY	Outlook favorable for small, steady gains in pig iron and steel production in April.	.....	.....	Although pointing upward, steel and pig iron production volume considerably below normal for this period of the year.
PLUMBING AND HEATING	Slight improvement anticipated in April.	Retail stocks will continue low, and buying will be for immediate needs only.	Collections continue good.	High grade residential work showing improvement, with general building still depressed.
SHOES	Return to normal and regular selling, equal to or possibly better than April, 1930.	Increase of stock on shelves over March, and it will be a more salable stock than in April, 1930.	Improvement over March, but below April, 1930.	If every other month of the year held as much promise, there would be nothing wrong (at retail) in shoes.

Stewart Announces Eight-in-Line With 3½-Ton Capacity

THE Stewart Motor Corp. of Buffalo announces its new eight-in-line, 3½-ton chassis designed for long-distance, high-speed operation.

The Lycoming A.E. engine is an eight-in-line, L-head type, with a bore and stroke of 3¾ in. x 4¾ in., developing 130 hp. The piston displacement is 420 cu. in. This engine develops its greatest torque at slow speeds thereby giving exceptional high gear performance. Three-point suspension mounted on rubber. The crankshaft is equipped with a balancer on the front end. Lubrication is by full force feed system. The swan type manifolds embody heat control. (See *Automotive Industries*, Nov. 22, 1930, page 780.)

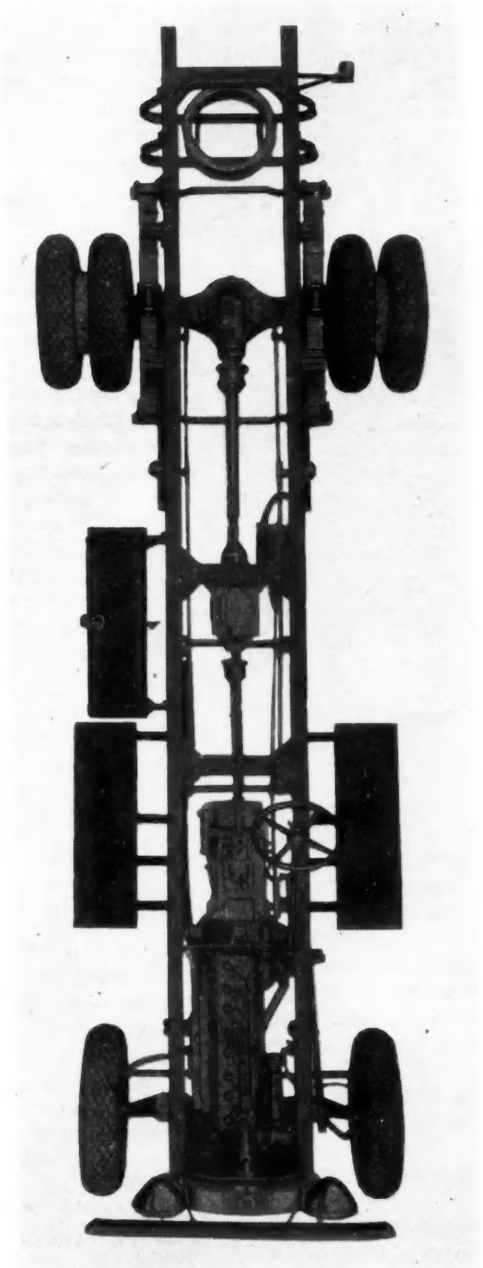
The radiator has a polished cast aluminum shell with vertical tube core.

The ignition is battery type, semi-automatic distributor, and the starter and electrical equipment is Delco-Remy. The Stromberg carburetor is equipped with an air cleaner.

The Brown-Lipe clutch is a multiple disk.

Two transmissions provide twelve speeds forward with three reverse, and include an overdrive. A four-speed transmission is attached to the engine and a three-speed auxiliary transmission is mounted amidships. Both units have hardened nickel steel gears, and are equipped with standard S.A.E. large openings for power take-off.

The gear ratios follow: Standard unit powerplant transmission, low, 6.92:1; second, 3.47:1; third, 1.89:1; fourth, 1:1; reverse, 8.06:1. The auxiliary transmission has three speeds: High, 1:1; overdrive, .67:1; low, 2.25:1. With standard rear axle ratio of 7.3:1, total reductions in low are as follows: First, 114:1; second, 56.9:1, third, 31:1; fourth, 16.4:1; reverse, 132:1.



The new Stewart eight-in-line truck chassis. The engine has a three-point suspension on rubber + +

The front axle is of the reverse Ellicott type, with Timken bearings in the wheel hubs and ball thrust bearings on king pins.

The rear axle is a Timken full floating double gear reduction unit with optional worm drive. The double reduction carrier and worm carrier are interchangeable in the same axle housing.

Ratios of double reduction axle are 7.3:1 standard, with special ratios at extra cost, are 6.3:1 and 8.1:1. Ratios of worm axle are 7.25:1 standard, with special ratios of 6:1 and 8.66 to 1 at extra cost.

Service brakes are Bendix Duo-Servo four-wheel, mechanically operated by B-K booster rods on the rear and cable on the front. Front brakes are 16 in. x 2½ in. and the rear are 17¼ in. x 4 in. The hand brake is a contracting band, 11 in. x 5 in., type mounted on the rear of the transmission.

Balloon tires, 9.00/20, dual rear are standard, Wheels are cast steel hollow spoke type. The chassis will accommodate bodies 11 to 18 ft. long.

The standard wheelbase is 170 in. Special wheelbases, at extra cost.

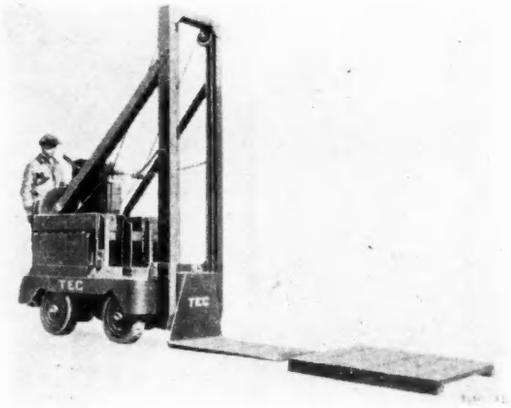
NEW DEVELOPMENTS—AUTOMOTIVE

TEC Elevating Truck

A NEW four-wheel drive skid handling truck has recently been added to the line of materials handling equipment manufactured by the Terminal Engineering Co., New York. The TEC machine is small enough to work in box cars, yet carries its loads of 3000 lb. in an overhung position.

The skids used with this new elevating truck are the lowest possible. The skid height need only be 2 in. below the platform. They can be easily made from scrap lumber, using 2 in. x 4 in. boards, on their flat sides, for the legs. Having these legs run the full length of the skid gives a "web-footed" effect so that the skid is more stable when stacked than one having four high legs at the corners. There is also no tendency for the board skid legs to damage the goods on the underneath skid load when stacked, as so often occurs with the four-corner type of skid leg.

Having a four-wheel, four-motor drive, the truck travels 10 m.p.h. empty and 7-9 m.p.h. with



1½ ton load. The elevating speed varies from 25 ft. to 40 ft. per minute with the standard motor, but increases up to a maximum of 60 ft. per minute if a special high-speed hoist motor is used. The loads are all carried in an overhung position with no wheels directly under the load. The overhung design enables tiering skids without the aid of a helper, thus speeding up the work and lowering the operating costs.

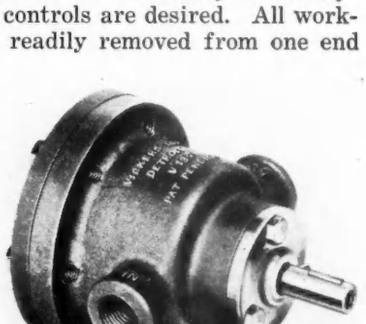
The same chassis is used on the new elevating truck as on the Model BC36 heavy-duty crane and Model BS36 shovel truck recently announced by the Terminal Engineering Co. Thus, a maximum number of parts are interchangeable, not only on these three types, but on every type of TEC truck.

Speed with safety is obtained on these trucks by using such devices as: (1) an automatic stop on the up-stroke of the table; (2) two independent sets of brakes: (a) mechanical on two wheels, and (b) electrical on four wheels; (3) controls located within outer edges of truck at all times.

Vickers Hydraulic Pumps

HIGH volumetric efficiency (very low slip), 500 lb. per sq. in. continuous working pressure and 1000 lb. for press work, and long life with quiet operation are claimed for the Vickers V-Type Rotary Pumps which are being placed on the market by Vickers, Inc., Detroit, Mich.

Two sizes are now available, the capacities being 15 and 30 gal. per min. at 1000 r.p.m. These pumps are for use in all machinery where hydraulic feeds and controls are desired. All working parts can be readily removed from one end without disturbing motor connection or pump piping. The performance curves show that there is no appreciable drop in volumetric efficiency and delivery at higher pressures and that the overall mechanical efficiency is practically constant from 500 to 1000 lb. pressure.

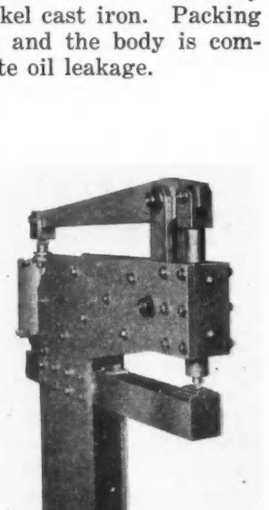


All parts are interchangeable and larger capacity is secured by changing the internal parts. Small installation space is required in proportion to capacity; the weight of the pump is only 32 lb.

The rotor, ring and vanes are alloy steel, hardened and ground, while the port bushing and flange bushing are of hydraulic bronze. The body is of special high-test nickel cast iron. Packing is not under oil pressure and the body is completely drained to eliminate oil leakage.

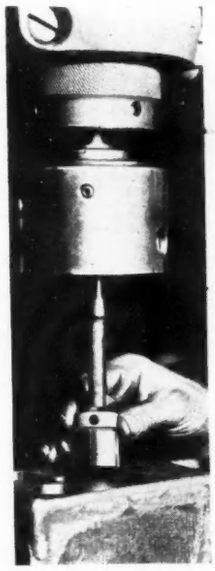
Hannifin Piercing Press

TWELVE tons' pressure is provided by the air-operated press built by the Hannifin Mfg. Co., Chicago, Ill., for piercing 1 5/16 in. diameter holes in 3/16 in. copper boiler shells. An interest-feature of this press is that it is constructed entirely of steel plates and shapes. Ram stroke is 1⅛ in.



PARTS, ACCESSORIES AND PRODUCTION TOOLS

P. & W. Stub Gages for Precision Boring



STUB GAGES have been added to the line of the Pratt & Whitney Co., Hartford, Conn., for precision boring and similar operation where the clearance between the tool and the hole is short. In most precision boring machines the vertical travel of the tool is obtained by a quill, while the head itself remains clamped in one position. This is desirable practice, because a movement of the head itself to provide gaging clearance below the tool might introduce errors that could be objectionable if the tolerances are very close. With the new stub gage this difficulty is overcome, as the ordinary quill travels provide sufficient clearance for its use.

These gages are made of alloy tool steel and heat treated for the requisite gage hardness and toughness. The gaging surface is machine-lapped to size. The gages are available either singly or as a set of 17 sizes in a wood case. Sizes are 1/8 in., 3/16 in., 1/4 in., 5/16 in., 3/8 in., 7/16 in., 1/2 in., 5/8 in., 3/4 in., 7/8 in., 1 in., 1 1/8 in., 1 1/4 in., 1 3/8 in., 1 1/2 in., 1 3/4 in. and 2 in.

The Jaeger Chronoflite

THE Jaeger Chronoflite, made by the Jaeger Watch Co., 304 East Forty-fifth St., New York City, is a new precision instrument incorporating a stop watch, an elapsed-time watch and an eight-day clock.

The easy reading split-second stop watch operates as any professional stop watch and it can be read to the fifth of a second for determining the rate of climb, ground speed, racing events, etc.

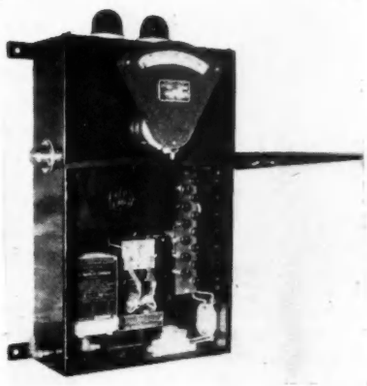
The elapsed time dial is equally useful in recording separately the timing of any part of the distance.

The manufacturers claim that the most exacting precision manufacture has gone into this instrument. If desired, it may be had with radium numerals.

Maehler Temperature Control

TO provide an automatic temperature control for users of industrial ovens employing Maehler Universal heaters, the Paul Maehler Company, Chicago, Ill., has developed an electrical control unit which embodies in compact from all the functions of numerous devices previously used.

This unit is contained in a cabinet (shown open in illustration) 20 in. x 16 in. x 5 in., utilizing a raised lid which may be locked to prevent tampering. It may be installed at any convenient place adjacent to the heating equipment which it controls. In the cabinet are assembled the various devices providing automatic control and which include the main switch, fuses, temperature control valve, the automatic mercury actuator, a gas pressure controller, high voltage transformer, time daily control, and red and green flasher lights which indicate the operation at all times.



The cabinet is energized by a 110-volt line direct from service line through a snap switch on outside of cabinet. Inside the cabinet, current is distributed to the various devices through a jack. Attached to the outside of the cabinet is the indicating controller which may be set for any temperature desired.

Adjustable arms provide the maximum and minimum range and when contact is formed with the temperature indicating arm, the electrically operated temperature control valve closes or opens automatically as the case may be, thus retarding or increasing the fuel supply to the oven and maintaining oven temperature within the desired range.

On the heater itself is located a Maehler-Maxon automatic shut-off safety valve, which in event of either fan or fuel failure automatically shuts off of the fuel supply.

The entire electrical input to the control unit is but 175 watts, and but 75 watts per hour are used continuously; the balance of 100 watts being momentary at the time of electric spark and temperature control operating.

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

Standard Gage Comparator

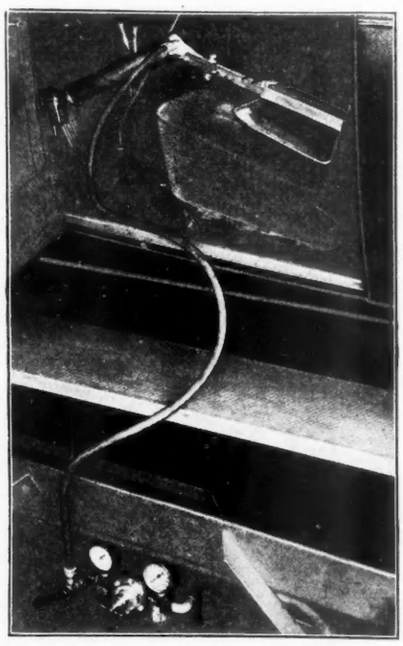
ANOTHER comparator for quality control and for checking master gaging equipment is made available to the automotive field with the introduction of the model No. 105 standard comparator, manufactured by the Standard Gage Co., Poughkeepsie, N. Y. This instrument may be equipped with either of two types of indicators. The Model 2X is of the dial type and provides readings in steps of 0.0001 in. with a possibility of estimating to 0.00005 in. When equipped with the Model 2X indicator of the sector type, the graduations are 0.00005 in. with a possibility of estimating even closer. This indicator is recommended for final inspection of master gages and for laboratory work.

Probably the most important feature of this instrument is that the table instead of being a flat surface is relieved to eliminate adhesion. It is made of steel, hardened and seasoned, and is ground and lapped to practically a perfect plane surface. The process involved is said to be similar to that employed in making master gage blocks.

Bendix-Cowdrey "Human Leg"

A PEDAL-PRESSURE measuring device has been brought out by Bendix-Cowdrey Brake Tester, Inc., South Bend, Ind., a division of Bendix Aviation Corp. It is expected to be used in the brake testing field. This new product is known as the "human leg" and functions in the same manner as the motorist exerting pressure on the brake pedal. It is adjustable for angles and length, and will fit all makes of cars and pedals. It is equipped with gages which indicate the pressure exerted on the pedal, and records the exact amount of pedal "push." Following are directions for operating this device:

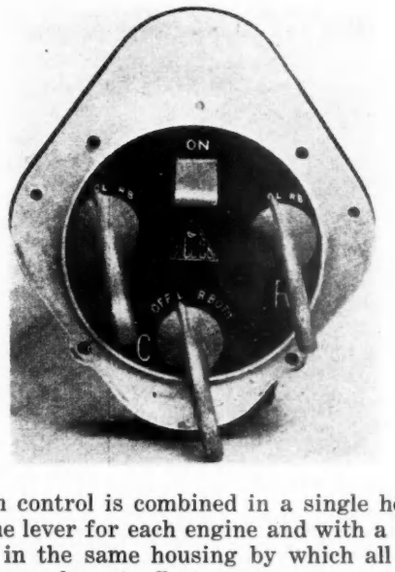
Place the "human leg" in driver's seat. Attach clamp to pedal with cylinder rod below center of pedal. Adjust "knee joint" for approximately correct angle and adjust "thigh bone" for length. Use T handle on reducing valve for obtaining desired pedal "push" reading on gage. Open and close lever handle bleeder valve to admit and release air pressure in cylinder.



To change from a high pedal pressure to a lower one when exhausting the air from the cylinder, open bleeder valve first before readjusting reducing valve.

Delco Combination Airplane Switches

AMONG products recently marketed by Delco Aviation Corp., a subsidiary of Bendix Aviation Corp., are complete lines of ignition switches for airplanes equipped with two or more engines. By means of this type of ignition switch

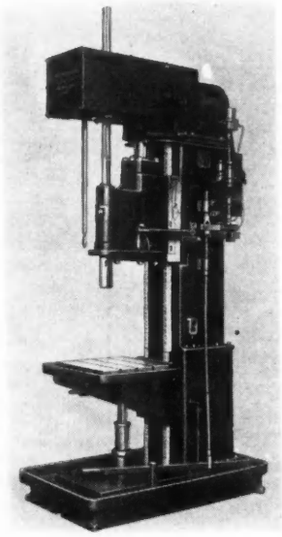


ignition control is combined in a single housing, with one lever for each engine and with a master switch in the same housing by which all of the engines can be cut off at once.

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

Master Heavy Duty Drills

MASTER" drilling machines with a maximum drill capacity in steel, of 1½ in., 2 in., and 2½ in., are offered by the Superior Machine Tool Co., Kokomo, Ind. These new models, 20 in., 25 in., and 30 in., respectively, are single spindle machines available with either hydraulic or geared feeds. An outstanding feature is the provision for attaching multiple heads, thus converting the machine for multiple spindle work. Flexibility is evidenced by the range in speed, of 68 to 842 r.p.m., made available by constant or variable speed motors built in at the upper section. The drive is effected through helical gears with shafts mounted on Timken bearings.



Approximate capacities for multiple spindle work are, respectively, as follows: 30 ¼-in. drills, 40 ¼-in. drills, and 58 ¼-in. drills, in machine steel. Motor capacities are 5, 7½ and 10 hp. at 1750 r.p.m. for the 20, 25 and 30 in. models. Net weights, 2500, 3600 and 4700 lb. Floor space, 30 x 50 in., 31 x 52 in., and 32 x 55 in.

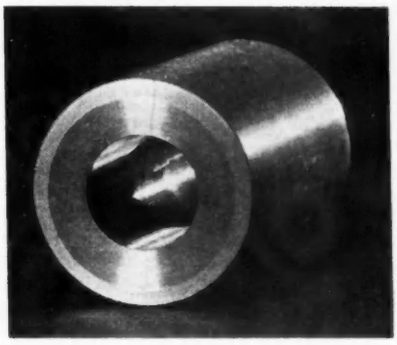
Self-Locking Set Screw

A NEW self-locking set screw has been placed on the market by the Shakeproof Lock Washer Co. of Chicago. As may be seen from the illustration, one half of the upper, slotted portion of the set screw is offset with relation to the other, so that when the set screw is screwed home, the upper portion is under elastic stress, and when it is attempted to unscrew it, the sharp edges of the thread dig into the surrounding metal. The same resistance is opposed to any other force tending to loosen the screw, such as jar and vibration. The amount of the offset is varied to suit the conditions under which the set screw is to be used. If the part is subjected to severe vibration, the offset is made comparatively large, whereas in cases where this does not apply and where, on the other hand, the set screw may have to be removed occasionally, the offset is made less.

Detroit Lining for Steel Tubes

A NEW method of lining steel tubing with noncorrosive metals or alloys is being announced by the Detroit Seamless Steel Tubes Co., which has acquired an exclusive license under the patent rights to the process. It is claimed that in the process of production of this tubing the inner lining metal is bonded with the steel shell so intimately that the two cannot be separated by any mechanical means.

The greatest industrial possibilities of the process, according to C. H. Hobbs, president of the company, are in the manufacture of steel-backed bearings. Mr. Hobbs states that any specified thickness of bearing metal can be applied to the shell with great accuracy, and that tubes can be economically fabricated in lengths of 18 ft. or more, so that bearing manufacturers with the proper shop equipment can produce bearings of varying lengths from the same tube, which will permit them to cut down their finished stock to a minimum.



One advantage claimed for this method of manufacturing bearings is an improved texture of the lining material, which is due to the fact that it is cast into the shell by a centrifugal process, and is, therefore, denser and more nearly homogeneous. Another advantage resides in the uniformity of heat expansion of the steel-backed bearings and the steel shafts, and manufacturers of electric motors are said to have discontinued the use of bronze bushings to obviate the troubles due to the unequal heat expansion of bushing and shaft and the consequent changes in bearing clearance.

A wide variety of metals and compositions can be applied to the steel shells, and numerous other applications besides that referred to in the foregoing are visualized for the new tubing. Among the lining materials already successfully used are bronze (of many compositions), copper and tin. Tubes so lined may be used for conveying liquids that attack steel; in water-tube boilers, where the high heat conductivity of the lining is of some value, and in water systems as a substitute for copper and other tubes, where strength is essential.

Automotive Oddities—By Pete Keenan

ONE HORSE POWER
THE VELO-HIPPIQUE, PARIS, 1906
A HORSE RUNNING ON AN ENDLESS BELT ACTUATED THE GEARS. IT WAS CLAIMED THE HORSE COULD EASILY DO 125 MILES PER DAY.
ABOUT 26,000,000 DOLLARS WAS GIVEN IN TIPS LAST YEAR TO NEW YORK TAXI DRIVERS.
ENGLISH POLICE ARE TRYING TO HAVE ALL APPLICANTS FOR AUTO LICENSES FINGER-PRINTED
THE JUNK-MAN OF THE AIR
BALBONI'S-AERONAUTICAL JUNK-MAN = Los Angles.
APRICO
BALBONI'S AIRPLANE SUPPLIES
MARIE LUHRING, FIRST WOMAN MEMBER OF THE S.A.E., IS EMPLOYED IN THE ENGINEERING DIVISION, ENGINE DEPT., OF THE INTERNATIONAL MOTOR CO'S PLAINFIELD, N.J. PLANT.

NEWS OF THE INDUSTRY

Century Airlines Begin Operation

E. L. Cord Heads New National Transportion Unit; Hourly Service Planned

CHICAGO, March 26—Opening of the Century Airlines simultaneously in six cities on March 23, marked formal entrance of the Cord group into the air transportation operating field.

E. L. Cord, president of Cord Corp., chairman of the board of Auburn, Duesenberg, Lycoming Mfg. Co., Stinson Aircraft Corp., Columbia Axle Co. and affiliated companies, also heads the new transport line. L. B. Manning, vice-president of the Cord Corp., is vice-president and general manager of the Century lines.

The first unit is between Chicago and St. Louis via Springfield, Ill., and Chicago, Toledo, Detroit and Cleveland.

Planes are being operated on frequent schedules at rates comparable with rail tariffs. As fast as equipment is delivered schedules will be increased to hourly service, according to Mr. Manning.

Impressive ceremonies were held in all six terminal cities preceding formal opening of the lines and in Chicago eight tri-motored Stinson airliners were christened Saturday by eight Chicago society women. Thursday and Friday similar ceremonies were held in the five terminal cities of the line.

Aluminum Industries Profits

CINCINNATI, March 26 — Reports showing January and February well in excess of the same months last year in the demand for automotive replacement parts was submitted to stockholders of Aluminum Industries, Inc. at the annual meeting. Added to this was the announcement that the company's earnings in 1930 were $1.86 a share. March business also is said to be greater, to date, than in the same month last year.

New Tire Line Ready

DETROIT, March 26—A new line of G & J tires has been announced by the manufacturer. Production is in full swing, with distribution on a national scale.

The News Trailer

By Herbert Hosking

R. H. **Scott,** Reo president, whose company reenters **Canadian** mfg. this week, is a native of Canada * * * **Stewart** Truck also plans a Can. plant * * * **Dominion** Motors (Durant-Nash hookup) expects to **start** about end of May * * * Ford of England is **advertising** industrial engines for £38 in the British **Engineer** * * * After 40 yrs. as a **stable** ministering to **hayburners,** the Chicago building of the **Railway** Express Agency is being done over as a car repair shop . . . the company still runs 122 wagons * * * Maj. P. J. Brady, Dem. candidate for Chicago city clerk, promises **sale** of car licenses from **neighborhood bank** branches—if he is elected . . . they'll be giving out premiums with 'em next * * * there are still about 20 toll roads in the U. S., according to a **forthcoming** study . . . every low-type road is a toll road if you aren't particular about **definitions** * * * **Lycoming** is tooling-up for **bigger** and better * * * More than a fifth of **Ford's** employees are participating in a company **investment** plan * * * streamlining research is being extended to rail equipment and rolling stock, **according** to **Westinghouse** * * * the Autogiro principle is being used on cabin planes and seaplanes in **England** * * * **Hudson** sponsors and **vouches** for this one: the Prince of **Wales,** now visiting **British** goods **exhibit** in South Am., was asked to **pose** for a photo with a Hudson car . . . he consented, provided that a **British** product could appear in the picture somehow . . . compromise was effected by mounting a **Dunlop** tire cover on the rear **spare** . . . **Dunlop** in proper **big** letters of course . . . the **Prince** then rode around in the **Hudson** with clear **conscience,** bless his Royal **buttons** * * * Herbert **F. Poehle,** U. S. Rubber **engineer,** has been named a **2nd lt.** in the **Q. M. Reserves** * * * Forthcoming definitive registration figures show that Mich. had the largest decline in total registrations for the yr. 1930 . . . drop will be about 66,000 . . . that's about the number of jallopies H. F. has melted up out at Dearborn * * * **Walter Carver,** who used to be with us, and is now with G. M. Export, has been transferred to England from Poland.

Institute Offers New Junking Plan

Would Establish Bonded Car Scrapping Depots in Key Cities

NEW YORK, March 25—Plans for scrapping junked automobiles on a wholesale basis have been proposed by the Institute of Scrap Iron and Steel and will be submitted shortly to the automobile manufacturers, according to announcement made here yesterday. The Institute is made up of over 400 firms throughout the country who engage in reclaiming scrap metal for return to the steel mills for further use.

The plan calls for the designation of scrap yards in several key cities, which will take automobiles, scrapped under existing or new junking plans, under bond, guaranteeing that no part of a scrapped car will find its way back into the second-hand replacement market. The metal will then be reclaimed and shipped to steel mills for consumption.

The Institute estimates that if this plan is adopted 3,000,000 motor vehicles will be scrapped yearly, resulting in a yield of 1,500,000 tons of steel and iron.

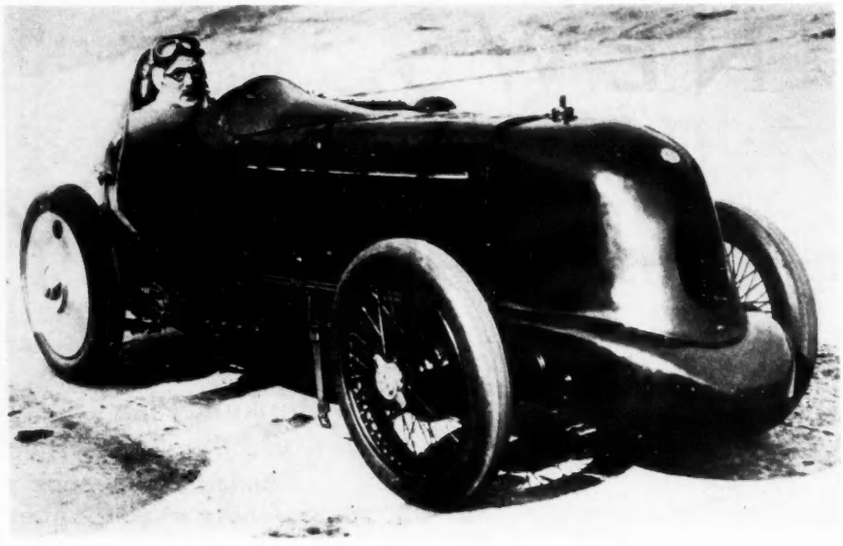
The establishment of scrapping centers in several cities was held necessary to avoid the problem of having to transport obsolete cars for great distances.

Since the adoption of the highway safety plan by the National Automobile Chamber of Commerce a year ago that body estimates that its members have scrapped some 350,000 cars. Present indications are that a much greater volume of old cars will be destroyed in junking yards during 1931. Participation in some form or other of scrapping is now practiced by manufacturers representing 87 per cent of the production.

The Institute of Scrap Iron and Steel, in its plan would tie in with the car manufacturers' junking plans and would ease the way for the complete removal of the cars which are now junked.

Approximately 50 to 55 per cent of the charge in open hearth steel furnaces of today is scrap metal, with the balance made up of pig iron. Certain mills use only scrap metal in the production of their steels. The average run is from one-third scrap and two-thirds pig to two-thirds scrap and one-third pig.

The Institute feels that if the cooperation of the manufacturers could be obtained, it would assure a sufficient volume of cars for these bonded yards that could be designated in these various cities to devote their attention exclusively to the scrapping of automobiles on a profitable basis. However, it would probably be necessary for the manufacturers to cooperate with their dealers in some form through the setting up of a junking fund, similar to that now employed in a number of instances, in order to make it worth the while of the dealers to dispose of the older cars. It is understood that some of the large car manufacturers are considering this plan with some favor.



Attains 100 M.P.H. on Midget Car

With the M.G. Midget special, shown above, prepared for racing by E. A. D. Eldridge, G. E. T. Eyston (behind the wheel) became the first driver to attain an official speed of 100 m.p.h. with a car of 750 c.c. displacement. The official record of 102.76 m.p.h. for five miles, was made during the week of Feb. 14 at the Monthlery track in France

Michigan Employment Gains

DETROIT, March 23—In the automobile industry in the state of Michigan as of February 15, there were 153,969 employees, a decrease of 46,558 from the total of 200,527 in February, 1930, but an increase of 2229 over the total of 151,740 for January, 1931, according to a report by the State Department of Labor and Industry, based on reports of 43 companies.

The aggregate weekly payroll for the automobile industry in the state during February was $4,101,238, as compared with $2,233,378 in January and $6,392,154 in February, 1930.

The average weekly earnings per capita in the automobile industry were $26.63 in February, $14.71 in January and $31.87 in February, 1930.

Essex Wins Court Appeal

DETROIT, March 23—Essex Motors, division of Hudson Motor Car Co., won its appeal before the U. S. Board of Tax Appeals, protesting against deficiency assessments of $122,319 and $25,906 on its income tax returns for 1919 and 1920 respectively.

The value of the property at that time, which was placed by the commissioner of internal revenue at $250,000 was not less than $400,000, according to a decision by the board and attested by witnesses for the company. Accordingly, the commissioner was directed to recompute the tax liability.

Aero Directory on Press

PHILADELPHIA, March 26 — The third annual issue of the Chilton Aero Catalog and Directory, and the fourth issue since the directory was first published in 1911, is now on the press and will be ready for distribution about April 6. The forthcoming issue has a number of features now included for the first time; among them: Aero data by states, airport data by states, aero data on overseas markets, aero engineering standards of the S.A.E., list of scheduled airline operation companies with their officials, corporate structure of aeronautic holding companies, analysis of airplane design and equipment items.

Vandervell-Bosch Pool

LONDON, March 16 *(by mail)*—It was announced here today that an arrangement has been entered into between C. A. Vandervell & Co., and Robert Bosch, A.G., the result of which will be the pooling of technical resources, and the joint manufacture of C.A.V. and Bosch commercial vehicle electrical equipment in London. To enable the scheme to be put into operation, Robert Bosch, A.G., will acquire a certain financial interest in C. A. Vandervell & Co., but control will remain with the present owners of C.A.V., viz., Joseph Lucas, Ltd.

The arrangement also comprises a full interchange of technical information and patents between Joseph Lucas, Ltd., and the Robert Bosch, A.G., but no financial arrangement is involved or contemplated between these two companies.

FWD Sales Increase

CHICAGO, March 25 — The Four Wheel Drive Auto Co., Clintonville, Wis., reports a sales increase during the month of February of 22 per cent over February of 1931. The sales in- over February of 1930. The sales increase since 1921 has been 1182 per cent, the company announces.

M.&E.A. Elects Two Directors

F. G. Wacker Made Assistant Treasurer

NEW YORK, March 25—Directors of the Motor and Equipment Association, meeting at the Hotel Astor yesterday, elected C. C. Carlton, secretary of Motor Wheel Corp., Lansing, and J. C. Ferguson, president of Eclipse Machine Co., Elmira Heights, N. Y., to the board of directors, succeeding C. H. L. Flintermann of Wilcox-Rich Corp., Detroit, and L. M. Wainwright, Diamond Chain & Mfg. Co., Indianapolis, recently deceased. The board of directors also elected F. G. Wacker, president of Automotive Maintenance Machinery Co., as assistant treasurer.

At this meeting the following companies were admitted to membership: Division A—Chase Brass & Copper Co., Waterbury, Conn., and Lea Fabrics, Inc., Newark, N. J.; Division B—Oildraulic, Inc., Memphis, Tenn., and J. A. Tumbler Laboratories, Baltimore, Md.

There was also a group of companies who had formerly been members of the association, but had permitted their membership to lapse, who reaffiliated themselves with the organization at yesterday's meeting. These are: Yankee Metal Products Co., New York City in Division B, and in Division C the Specialty Auto Parts Co., Inc., New York City; Lehr Auto Supply Co., New York City; E. A. Bowman, Inc., Detroit, and M & N Co., Cleveland, Ohio.

Plan Second Joint Show

NEW YORK, March 25—The second joint fall show of the Motor and Equipment Association and the National Standard Parts Association will be held in Atlantic City during the week of Dec. 7, it was announced today jointly by E. T. Satchell and C. E. Burgess, president, respectively, of the M.E.A. and the N.S.P.A. This is the first time that either of these associations have held their exhibits in the East. Last year's exhibit at Cleveland, Ohio, which was the first joint show put on by these two associations, was so well received that this practice of holding the exhibits together will be followed again this year.

New Brunswick Revenue Up

FREDERICTON, N. B., March 23—Returns from the gasoline tax and motor licenses make up the largest item in any department of the New Brunswick Provincial Government for the past fiscal year, according to recent reports. Net returns from the licensing of motor vehicles totalled $875,766.88 and from the gasoline tax $661,007, with a grand total of $1,536,773.88. The sale of gasoline, despite prevailing conditions, the report shows, registered an increase of 33 1/3 per cent.

United Aircraft Reports 1930 Profit

Net Income Reached $1.64 Per Common Share

NEW YORK, March 25—United Aircraft and Transport Corp. and subsidiaries report net income for 1930 of $3,302,206 after all charges. This is equivalent to $1.64 a share on average outstanding common stock. Consolidated net income for the year on the properties owned throughout the year is $2,582,206, or $1.28 a share, on comon stock after payment of preferred dividends. This compares with earnings of $8,966,032, or $5.42 a share, for 1929.

The consolidated balance sheet of the company shows current assets of $23,844,830 as against current liabilities of $1,997,621. Cash and readily marketable securities are placed at $14,213,946.

During the year all manufacturing subsidiaries were brought up-to-date in the way of equipment and facilities. A large share of the work done by these subsidiaries was in the nature of intensive engineering and development work. No additions to equipment companies were made during 1930, but all the outstanding stock of Varney Air Lines, Inc., and 97 per cent of the outstanding stock of National Air Transport, Inc., were acquired.

Hudson Sales Increase

DETROIT, March 25—Hudson Motor Car Co. announces that its sales for the first three weeks in March exceed those in the first three weeks of February by 38 per cent. W. J. McAneeny, president, said that the weekly factory payroll is now the largest in eight months.

Auto-Lite Elects Minch

TOLEDO, March 25—J. A. Minch, for 16 years an executive of the Electric Auto-Lite Co., lately serving as assistant to C. O. Miniger, president, was elected vice-president in charge of production by directors, meeting yesterday. Stockholders reelected all directors and other officers were continued.

Announces Safety Contest

NEW YORK, March 25—The Highway Education Board has announced its tenth national campaign for street and highway safety of 430 cash prizes and an equal number of medals to elementary school pupils, and prizes totaling $1,000 to elementary school teachers.

Studebaker Truck Sales Gain

CHICAGO, March 24—Studebaker trucks have mounted to sixth place from eighteenth, in registrations, in five months, C. H. Wondries, vice-president in charge of sales for S. P. A. Truck Corp., announces.

Met Section Meets

NEW YORK, March 27—The Metropolitan Section, Society of Automotive Engineers, held its regular monthly meeting at the American Woman's Association Building here last night.

Charles Coolidge Parlin, manager of the Division of Commercial Research of Curtis Publishing Co., was the speaker of the evening and he outlined the status and prospects of the aviation industry. The next meeting is scheduled for April 9, immediately preceding the opening of the Detroit aviation show.

Cars Need Fewer Replacement Parts

SOUTH BEND, March 25—An interesting sidelight on the improvement in technical quality of the modern automobile has been furnished by the Studebaker Corp., which keeps records of replacement parts sold over a number of years. In 1922, the sale of Studebaker replacement parts per car in operation amounted to $11.88. At the end of 1930, this figure had declined to $4.91.

Willys Stages Driveaway

TOLEDO, March 25—Willys-Overland dealers from Nebraska, South Dakota and Iowa in a special train of 12 Pullmans, arrived here tonight after visiting Wilson Foundry & Machine Co., Pontiac, to remain overnight and drive away 200 cars and trucks Thursday. L. A. Miller and P. C. Gartley addressed the dealers at Toledo Club at dinner.

Bendix Earnings Reported for 1930

Net Was 56 Cents a Share; Cash Position Good

CHICAGO, March 23—Revealing a working capital position of better than five to one, and with cash equivalent to more than twice all current liabilities, the 1930 annual report of the Bendix Aviation Corp. was released to the stockholders today by Vincent Bendix, president.

Current assets at Dec. 31, 1930, totaled $12,996,846, the report shows, including cash and call loans of $5,646,631, against current liabilities of $2,569,106. Total assets were $65,867,465.

Net income for the year, after all charges and income taxes, amounted to $1,183,860, equivalent to 56 cents a share on 2,097,663 shares of common stock outstanding at Dec. 31, 1930. In 1929 net income was $7,416,408, or $3.53 a share on 2,097,454 shares then outstanding.

The company made substantial investments in its foreign operations during the year under review.

G. M. of Canada Reduces Trucks

TORONTO, March 23 — Announcement has been made that a substantial reduction is effective immediately on General Motors truck prices. The decline ranges from $25 to $690 according to the model. On low prices general utility units, the decline is reported to range from $50 to $180.

Attains 100 M.P.H. on Speedboat

Gar Wood, veteran of racing waters, this week attained a speed of better than 100 m.p.h. in his speedboat, Miss America IX, at Indian Creek, Fla. The craft was fitted with non-supercharged Packard engines, upon which the late Captain Woolson, of Packard, was working at the time of his death

Steel Price Boost May Slow Market

Expected to Bring Late March Bookings

NEW YORK, March 26—With the going into effect next Wednesday of a $1-per-ton advance in the quotations of both the leading interest as well as "independents" for steel bars, plates and shapes, the steel market enters a show-down period. Either the volume of orders during the next six weeks will justify the mark-up or else the advance will become inoperative for want of support.

To smaller buyers the price situation cannot appear otherwise than puzzling. Large consumers have been afforded every opportunity to protect themselves at old prices over the second quarter, and where they did not do so it was because they felt such a course unnecessary. Producers of cold-finished steel bars have been booking second-quarter business at 2.10 cents, Pittsburgh, and are apparently covered to the extent of their obligations at the old price for hot-rolled bars.

In some quarters the advance in heavy rolled products is looked upon as nothing more than an effort to bring out as much business as possible at old prices during the last week of March. In flat rolled products keener than keen competition makes for very easy market conditions, so much so that full-finished automobile sheet prices are now definitely off $2 per ton, being generally quoted at 3.20 cents, Pittsburgh.

Buyers certainly have the upper hand in all divisions of the sheet market. A fair volume of orders has been booked by bolt and nut manufacturers, second-quarter deliveries, at old prices. Encouraging reports continue with reference to the rate at which finishing mills are able to operate as the result of the daily influx of specifications. Wire mills report an increase in automotive business.

Pig Iron—Automotive foundries continue to melt iron at a good rate, and while carload buying is more prominent than round tonnage purchases, the movement on the whole is relatively satisfactory. The price for Michigan delivery by Lake Erie furnaces is now $17. Valley quotations are $16.50 for No. 2 foundry and $17 for malleable, furnace.

Aluminum—Routine conditions prevail with prices unchanged.

Copper—The market remains easy at 10 cents, delivered Connecticut. Some of the large automotive consumers are reported to have virtually covered their 1931 requirements.

Tin—Dull. Spot Straits tin was offered at 27.15 cents at the beginning of the week.

Lead—A sharp break in London on Monday had no effect on the home market, which is rather quiet.

Zinc—Unchanged.

Kelsey-Hayes Reports

DETROIT, March 23—Kelsey-Hayes Wheel Co., Inc., has compared net profit for 1930 of $2,262,222, equal after preferred dividends to $2.69 on common, compared with net profits in 1929 of $3,316,460 or $4.11 a common share.

Ford (England) Adds Capital

Special to Automotive Industries

LONDON, March 25 *(by cable)*—The Ford Motor Co., Ltd. (of England), today offered its present shareholders an issue of 2,000,000 additional shares, with a par value of £1 per share. The issue price will be £3 per share, and each shareholder will be entitled to purchase two shares of the new issue for each seven shares of other issues now held.

At a meeting of the stockholders of the company, held last week, Sir Percival Perry, chairman, said that the additional capital is required for expansion of the company's operations, believed to be necessary and remunerative, but not specified in detail. The issue is made now, rather than later, in the belief that commodity costs are so low that added investment will prove most profitable, and will probably increase in value.

Stanley H. Bullard

BRIDGEPORT, CONN., March 25—Stanley Hale Bullard, vice-president of the Bullard Co., died March 22 at his home in Fairfield, Conn. He was 53 years of age.

Mr. Bullard was a son of Edward P. Bullard, founder of the Bullard Co., and was born in Hoboken, N. J. He had been prominent in the machine tool industry as a manufacturer for the past 35 years.

After graduating in 1890 from New York Military Academy he entered the employ of his father as an apprentice machinist.

He became manager of the New York office of the company, later becoming manager of the Eastern sales district, and in 1905 was made general sales manager. In 1915 he was elected a vice-president of the Bullard Co., and also became general works manager.

Byrd to Aid Meeting

BALTIMORE, MD., March 26—Announcement has been made that Rear Admiral Richard E. Byrd has become a special consultant to the sponsors of the Fifth National Technical Aeronautical Meeting, which will be held in Baltimore from May 12 to 14, and that Bernt Balchen will be one of the speakers.

Many addresses on technical subjects will be given during the gathering, which will be attended by leading experts from all parts of the country.

Boat Show Successful

BALTIMORE, MD., March 26—With almost 50 boats and all kinds of marine accessories on display, the third annual show held by the Baltimore Motor Boat Trade Assn. this week was a great success. Henry F. Huber, president of the association, was director of the show.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, March 24—There was no substantial change in general business last week. The most that can be said is that the very gradual improvement which had previously been noticeable in some lines continued. The textile trade made a good showing, although activity in this line was somewhat lower, with a slight easing of prices in some sections. There was some increase in steel output, with an improvement in the demand for sheets.

EMPLOYMENT

The level of employment in February increased 1.4 per cent above that in the preceding month, while total wages increased 7.5 per cent, according to a report issued by the Secretary of Labor.

CONSTRUCTION AWARDS

Total construction contracts awarded in 37 states during the first two months of this year, according to the F. W. Dodge Corp., were 6 per cent below those in the corresponding period last year. In the first two months of 1930 construction contracts awarded were approximately 50 per cent below those in the first two months of 1929. Residential construction during February showed the first improvement in a two-years' uninterrupted decline.

CAR LOADINGS

Railway freight loadings during the week ended March 7 totaled 723,534 cars, which marks an increase of 41,534 cars above those in the preceding holiday week, but a decrease of 150,182 cars below those a year ago, and a decrease of 224,005 cars below those two years ago.

EXPORTS

Exports during February totaled $226,000,000, as against $348,852,000 a year ago, while imports amounted to $175,000,000, as against $281,707,000 a year ago.

CRUDE OIL OUTPUT

Average daily crude oil production for the week ended March 14 amounted to 2,190,550 barrels, as against 2,156,700 barrels for the preceding week and 2,853,200 barrels a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended March 21 stood at the same level as in the preceding two weeks, namely, 76. The unchanged index for these three weeks follows 75.8 for both of the preceding two weeks. In other words, this index has remained at a stable level for five successive weeks.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended March 18 were 20 per cent below those a year ago.

STOCK MARKET

The stock market last week was irregular, but in the main the trend was upward. The volume of trading was light, increasing as the week advanced. Most issues showed small net gains for the week, while some issues, especially those of railroads, were depressed. Call money was maintained at 1½ per cent during most of the week, but dropped to 1 per cent at the end of that period, marking the lowest level on record since 1915.

Brokers' loans in New York City during the week ended March 18 increased $94,000,000, bringing the total up to $1,913,000,000.

RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended March 18 showed decreases of $11,000,000 in holdings of discounted bills, of $28,000,000 in holdings of bills bought in the open market, while there was an increase of $13,000,000 in holdings of government securities.

Reo to Manufacture In Canadian Plant

Takes Over Part of Old Dodge Holding

LANSING, March 24—The Reo Motor Car Co. will start assembly of passenger cars, trucks and buses on April 1 in part of the former Dodge Brothers plant at Toronto, Canada, according to announcement this week by Richard G. Hudson, export sales manager.

Reo is the third company to announce production plans for Canada recently. The first firms to make the move were Hupp and Nash.

The Reo company's charter for manufacturing in Canada dates back 22 years, Mr. Hudson said. Reo was the first manufacturer to undertake production operations in Canada on a volume scale. This production included fabrication of motors, axles and other vital parts at the St. Catherines, Ontario, factory, which was turned over to the production of war munitions in 1915.

Reo has retained its Canadian charter during the interval between relinquishment of the St. Catherines plant and re-establishment of Canadian production facilities. The company has also carried on a consistent activity in the Dominion, a sales office and and wholesale warehouse being maintained at Windsor in charge of W. C. Turnbull, who is to become resident manager of the new Toronto plant. The cars will be assembled in Canada for distribution throughout the Dominion and in Great Britain.

Reo Reports Assets

LANSING, March 24—Annual statement of the Reo Car Co., issued this morning, shows the ratio of current assets to current liabilities as 10½ to 1, one of the highest ratios in the company's history.

During 1930 Reo's sales amounted to $29,671,006.30, as compared to sales of $48,011,458.13 in 1929, the report shows. Loss of $1,989,147.97 for the year is reported. A reduction from $10,050,513.43 to $6,675,168.99 has been made in inventories. A substantial reduction in expense is shown.

Current assets of the company are set at $17,385,437.70 and current liabilities at $1,663,295.68. Cash and marketable securities amount to $8,015,573.44. Cash on hand is set at $4,185,481.33, with holdings in government, municipal and marketable securities set forth as $3,830,092.11.

Stock outstanding is unchanged, being 2,000,000 shares of common stock at a par value of $10 a share.

Six-Point Suspension

Canada's automobile tourist traffic established an all-time record in 1930, according to the Department of National Revenue. Foreign automobiles to the number of 5,409,458 bearing tourists entered Canada last year for varying periods of time. The corresponding figure for 1929 was 4,508,809, a previous record.

The British Empire Trade Exposition which opened March 14 at Buenos Aires, Argentina, numbers among its exhibits the late Major Segrave's "Golden Arrow," Sir Malcolm Campbell's "Bluebird" and the Austin Seven on which Campbell beat the world's speed record for midget cars at Daytona. Exhibits of stock cars are being held by Austin, Armstrong-Siddeley, Daimler, Humber, Hillman, M. G. Morris, Rolls-Royce, Singer, Triumph, De Vaux-Hall. A number of commercial chassis are also being exhibited. The British Ford Co. is showing trucks and tractors.

The Millers Falls Co., following a purchase of the Goodell-Pratt Co., has moved the main office of the Goodell-Pratt organization to Greenfield, Mass. The Millers Falls Co. hacksaw plant at West Haven, Conn., has been closed and production consolidated with the Goodell-Pratt hacksaw department.

The Fiberloid Co. is operating day and night to fill orders for sheets of pyroxylin for use in the laminated. The lacquer department is also operating part-time night schedule.

The Moore Drop Forging Co. is adding several hundred men in order to increase its production of forgings for automobile parts. A new electric furnace for melting steel for crankshaft casting has been installed.

Only British cars or motor vehicles of British manufacture, in which those of Canadian origin are included, may operate as motor buses or taxicabs in Hong Kong, Kowloon and the new territories, according to a recent decree.

The La France equipped, four-wheel-drive fire truck purchased by Imperial Oil, Ltd., New Toronto, Ont., for use in Colombia, S. A., was the first piece of motor-operated fire apparatus to be exported from Canada.

Trucks and Parts, Ltd., has received an order and begun production upon 350 passenger-car bodies from a Canadian automobile manufacturing company. The total contract amounts to 850 bodies, and after the first 350 are manufactured the remainder are to be ordered in blocks of 100 as market requirements permit.

McKinnon Industries Division of the General Motors Corp. completes this month its second year under General Motors management. In the two years since General Motors took it over the invested capital has been increased over a million dollars. Fifty-six thousand sq. ft. of floor space has been added to the factory.

The United States Tariff Commission will begin an investigation for the purpose of ascertaining the differences in the cost of production of crude petroleum, fuel oil, gasoline and lubricating oils in the United States and in foreign countries which export to the United States. This investigation is instituted pursuant to House Resolution 391, adopted on March 3.

Grahams File Answer To Chrysler Corp. Suit

Claim Their Acts Not Affected By Old Agreement

DETROIT, March 25—Graham-Paige Motors Corp. and three Graham brothers today filed their answer in the Federal suit here brought by Chrysler Corp., denying the Chrysler charges. The answer asserts that the commercial vehicles manufactured by Graham-Paige, comprising passenger car chassis with light delivery bodies, do not fall within the meaning of the Graham's agreement with Dodge, which, it is claimed, refers to truck for heavy-duty.

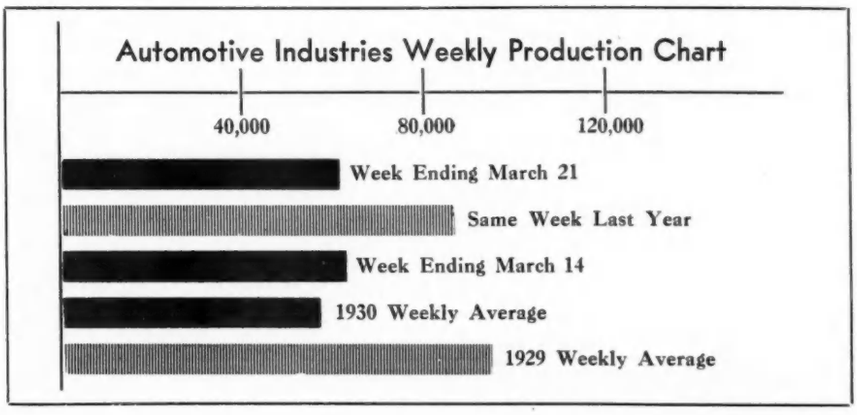
This agreement, the defendants state, set forth that Dodge Bros. Corp. was to continue to manufacture and sell "motor vehicles adapted to certain commercial uses, but of an entirely distinct type and for entirely different uses from the trucks manufactured by Graham Brothers, the principal difference being that the former (Dodge vehicles) are intended for lighter service only, such as parcel delivery, and consisting of an appropriate body for uses placed upon the ordinary passenger car chassis." Trucks were defined in the same agreement as being "distinctly for heavier duty, placed upon a stronger frame than would suffice for a passenger car and using a longer wheelbase."

"The individual defendants," says the answer, "never had any intention to restrict nor were requested to surrender their name in relation to any product in the manufacture or sale of which they had not been engaged." The defendants declare the Chrysler allegations as to the value of the name Graham are "a gross exaggeration," in support of which they assert that the Chrysler Corp., after acquiring the Dodge Bros. Corp., undertook to undermine the value of the name Graham, and substituted the name Dodge on the trucks and buses formerly known under the name Graham Brothers, types of vehicles that never had been manufactured by the Dodge Bros. Corp.

Lumber Market Better

MEMPHIS, March 25—Logging conditions in camps supplying the Memphis lumber sawmills are good, according to recent reports, but due to stagnant demand for most items, the more active logging had been directed to cooperage and dimension stock mills. The demand for lumber, in general, continues above production.

There has been a noticeable improvement in demand for lumber on the part of the automobile industry. This is expected to continue throughout the summer months. Quartered oak is in good demand, with the market continuing firm. Plain oak, gumwood, cottonwood, and ash are in only fair demand, with some improvement noted on the last item.



Men of the Industry and What They Are Doing

H. W. Chapin Retires

H. Winfield Chapin, president and general manager of the Brown-Lipe-Chapin Co., has announced his resignation from the active management of the company. He appointed Edwin F. Papworth, former assistant general manager, to the position of general manager.

Prior to becoming assistant general manager at the Syracuse plant, Mr. Papworth held a similar position with the McKinnon Industries, Ltd., St. Catharines, Ont.

De Tonnay Arrives in U. S.

A. M. De Tonnay, recently elected president of General Motors Argentina S.A., Buenos Aires, arrived in New York last week for a business conference with executives of General Motors Export Co. Mr. De Tonnay has been managing director of General Motors Argentina S.A. for several years prior to his elevation to the presidency. He was succeeded as managing director by W. K. Norton of New York.

McAneeny Meets His Dealers

William J. McAneeny, president and general manager of the Hudson Motor Car Co., held a meeting of dealers and salesmen in the New York territory at the Hotel Astor last week. This was one of a series he is holding throughout the country in the interest of securing greater enthusiasm and sales energy from his dealer organization.

Holley Elects Litle

Thomas J. Litle, Jr., former president of the Society of Automotive Engineers, has been elected a director and vice-president of the Holley Carburetor Co. Mr. Litle will continue his practice as a consulting engineer, according to the announcement of his new position.

Harris Leaves Franklin

Mark Harris, formerly manufacturing research engineer for the H. H. Franklin Mfg. Co., has announced his resignation from the company. He was formerly connected with the General Motors Corp. in a number of engineering capacities. He has announced no plans for the future.

Szekely Holds Election

O. E. Szekely and George W. Rundquist were reelected president and secretary, respectively, of the Szekely Aircraft and Engine Co., Holland, Mich., at the annual meeting of stockholders held March 16. F. E. Bradfield was elected vice-president; J. J. O'Brien, vice-president and treasurer, and L. D. Buhl, assistant secretary at the meeting.

The following directors were elected: O. E. Szekely, L. D. Buhl, A. H. Buhl, J. J. O'Brien, F. E. Bradfield, Fred Clark, Geo. W. Runquist, Neil Campbell, S. D. Den Uyl.

Delco Promotes Madden

E. D. Madden has been appointed service manager of Delco Products Corp., Dayton, Ohio, according to B. D. Kunkle, president and general manager.

Mr. Madden has been assistant service manager since 1929 and has been connected with the company for the past seven years.

Muskegon Elects Two

Claire L. Barnes and M. D. Harrison, president and vice-president, respectively, of the Houdaille-Hershey Corporation, were elected directors of the Muskegon Motor Specialties Co. at the annual meeting of stockholders, succeeding Otto H. Schultz and Charles Heuman. Other directors were reelected.

R. F. Glasson Resigns

Rex F. Glasson has resigned as director of sales promotion for the Dodge Bros. division of the Chrysler Motor Corp. Mr. Glasson has served in various capacities in the automotive industry for the past 12 years. He has made no announcement of his future plans.

Miles Leaves for England

NEW YORK, March 24—S. A. Miles, manager of the national automobile shows, sailed last week for England where he will visit for the next few months. He will probably return to this country some time in June.

Motherwell Joins Standard

A. A. Motherwell, who retired about five years ago as head of the General Motors forging plants at Detroit and Flint, has joined the Standard Forgings Co., Chicago.

Reed Succeeds Rose

A. L. Rose has resigned as sales manager of the Detroit Forging Co. and George B. Reed has been appointed to succeed him.

Emond Locates in Paris

William H. Emond, automobile body designer, is now located in Paris at 76, Avenue des Champs Elysees.

February U. S. Production Set at 219,897 Units

Compares with January Figure of 171,851

WASHINGTON, March 26—Reflecting an increase of 48,046, the production of motor vehicles in the United States in February rose to 219,897 units from 171,851 in January, according to reports from 144 manufacturers received by the Bureau of the Census. The February output of passenger cars was 181,735 units, an increase of 41,755, while the truck production rose 6051 to 37,635. The production of taxicabs was 529 against 512.

The Canadian output of motor vehicles rose to 9871 in February from 6496 in January. The passenger car output was 7529, compared with 4552, while truck production increased to 2342 from 1944.

Chilean Plant Producing

NEW YORK, March 24—Curtiss-Wright Export Corp. has just completed the production of five Curtiss Falcon observation planes for the Chilean Air Corps at its new factory, located at Los Cerrillos Airport, Santiago de Chile. These are the first airplanes built in the only airplane factory in South America. They were produced on the line method of mass production installed by Captain S. C. Coon, the manager, on the model system of Curtiss Aeroplane & Motor Co., Buffalo.

Rockne Joins Studebaker

NEW YORK, March 24—Paul G. Hoffman, vice-president of The Studebaker Corp. of America in charge of sales, has announced the appointment of Knute K. Rockne as manager of sales promotion. This appointment will not interfere with Mr. Rockne's duties as athletic director for the University of Notre Dame but will result in his devoting all of his time outside the football season to the interests of Studebaker.

Herbert G. Day

AKRON, March 25—Herbert G. Day, 49, president of the Philadelphia Rubber Works Co., Akron, Ohio, a subsidiary of The B. F. Goodrich Co., died in an Akron hospital yesterday following an operation. He was ill only a few days.

Mr. Day was president of the Philadelphia company slightly more than one year, succeeding the late John S. Lowman.

Toledo Reports Increase

TOLEDO, March 26—Toledo Steel Products Co. has reported a 30 per cent increase in the sale of replacement parts for January and February over the corresponding period last year.

Foreign Automobile Stocks Reported by Cable

WASHINGTON, March 23—Basing it upon coded cable reports from all leading offices of the Bureau of Foreign and Domestic Commerce, the Automotive Division has instituted with the beginning of March, a new monthly report of automotive vehicle stocks in foreign markets. The report appended describes vehicle stocks at the end of February. The estimate for each country is based upon a careful check by Bureau officers.

Country	PASSENGER CARS						USED CARS		TRUCKS AND BUSES			
	Low Priced		Medium Priced		High Priced				Heavy Capacity		Light Capacity	
	U.S.	Other	U.S.	Other	U.S.	Other	U.S.	Other	U.S.	Other	U.S.	Other
Porto Rico	N	...	N	...	N	...	...	...	...	...	...	...
Mexico	SL	...	SL	...	N	...	UH	...	N	...	SL	...
Panama	SH	...	SH	...	N	...	SH	...	N	...	N	...
Colombia	UL	UL	L	UL	UL	UL	N	UL	H	UL	UL	UL
Chile	H	N	H	N	UH	N	N	N	H	H	H	H
Peru	UL	...	UL	...	UL	...	H	H	UL	...	UL	...
Argentina	H	N	N	H	N	UH	L	N	N	UH	N	H
Brazil	N	H	N	H	N	N	N	N	H	H	N	N
Uruguay	N	N	L	UL	L	L	N	L	UL	L	N	L
Denmark	N	H	H	H	UH	N	UH	UH	L	H	N	L
Sweden	N	...	H	...	N	...	SH	UH	SH	...	N	...
Norway	N	N	N	N	L	L	H	L	L	...	N	L
Belgium	N	N	L	L	L	L	L	L	...	...	H	L
Netherlands	N	N	N	N	N	N	N	N	N	N	N	N
France	L	H	SH	H	L	N	H	UH	N	L	SH	UH
Germany	SL	L	UL	H	L	H	N	H	UL	H	L	SL
Portugal	UH	L	L	L	L	L	H	H	L	L	H	L
Czechoslovakia	UH	H	H	H	N	N	H	H	N	SH	UH	SH
Hungary	N	SH	UH	H	N	N	UH	UH	N	SH	N	N
Greece	N	...	N	...	N	...	H	...	N	...	N	...
Italy	...	SH	...	SH	...	N	...	SH	...	N	...	SH
Switzerland	UL	L	UL	L	N	N	UH	SH	N	N	L	N
Poland	UH	SH	H	SH	SH	N	N	N	N	N	SH	L
Rumania	H	N	N	H	H	UH	H	H	L	UL	H	L
Turkey	SL	SL	SL	SL	SL	SL	SL	SL	SL	SL	SL	SL
Egypt	L	H	SL	N	L	N	H	H	L	L	L	N
Gold Coast	N	H	N	H	None	None	...	...	H	N	N	None
Union of South Africa	H	N	N	N	N	L	H	H	N	H	H	N
China	Stocks considered high because of limited sales opportunity.											
Philippine Is.	N	SH	N	SH	N	...	H	...	...	...	SH	SH
Japan	N	N	H	...	L	...	N	N	N	...	N	...
N. E. Indies	N	SH	N	SH	L	H	H	...	L	N	SH	...
Br. Malaya	UH	N	N	H	...	...	H	H	N	N	H	N
Siam	H	UH	N	N	...	...	H	N	...	...	UH	N
Australia	H	L	H	N	UH	N	N	L	N	L	H	L
New Zealand	UH	N	H	N	L	L	H	N	N	N	N	N

H-High. N-Normal. L-Low. U-Unusually. S-Seasonally.

All descriptive terms used in this report pertain to the stock situation in relation to the current condition of each market. "High" stocks means the supply is considered large in relation to the current state of demand, although the same volume might be regarded as "normal" at a time when sales were more active. "Normal" is used almost synonymously with "adequate"—in other words, when the volume on hand is sufficient to supply immediate requirements plus the estimated demand for 1 to 1½ months. It is believed this method of reporting is more suitable than to describe the volume of stocks in comparison with some arbitrarily determined period which might be regarded locally as normal.

N. Y. Merchants Banquet

NEW YORK, March 23—The Automobile Merchants Association of New York, Inc., held its annual banquet at the Ritz-Carlton Hotel here last week. Lee J. Eastman, president of the association and president of the Packard Motor Car Co. of New York, presided and introduced as toastmaster William L. Colt, Dodge Motors, New York, Inc. Honorable James V. McKee, acting mayor of New York City, and "Senator" Ford were among the speakers of the evening.

C. H. Larson of Cutting Larson Co., on behalf of the members, presented Mr. Eastman with a silver tray as a token of recognition of his services as president of the association.

Plans Diesel Truck Output

PHILADELPHIA, March 23—A new company, known as Armstrong Saurer Commercial Vehicles Ltd., has been organized in England as a subsidiary of the Armstrong-Whitworth concern to manufacture motor trucks equipped with the Saurer Diesel engine built in England under license. Trucks of four tons' capacity and up will be built. The engines will be manufactured in fully equipped works that are being laid out at Scotswood, while practically all of the other parts that may be required for the trucks can be supplied by various other departments of the Armstrong-Whitworth Co.

Dealers Endorse Campaign

NEW YORK, March 23 — Interest among dealers in the Motor and Equipment Association's "Care Will Save Your Car" campaign has been increasing, as is evidenced by the fact that resolutions endorsing the program and recommending its use by their members have been adopted by the Grand Rapids Passenger Car Dealers Association, Wichita Automobile Dealers Association, St. Paul Automobile Dealers Association and the South Bend Automotive Trades Association.

A.E.R.A. to Hold Exhibit

NEW YORK, March 23—The American Electric Railway Association will hold its fiftieth annual convention and exhibition in Atlantic City, Sept. 26 to Oct. 2. In mailing out applications for exhibition space, special attention is being called to the fact that this is the golden jubilee of the A.E.R.A. and manufacturers are being requested to devote a portion of their display to historical exhibits.

Boat Registration Increases

WASHINGTON, March 23—There were 248,448 motor boats registered in the United States on Jan. 1, 1931, compared with 241,040 on Jan. 1, 1930, and 130,826 at the begining of 1930, according to the Bureau of Navigation, Department of Commerce.

The port of New York ranked first in the number of motor boats registered on Jan. 1 with 33,971. Motor boats registered at the port of Tampa, Fla., numbered 21,204 and was followed in order by Baltimore, Md., 15,123; Philadelphia, Pa., 14,975; Norfolk, Va., 14,251; Portland, Me., 13,187; Boston, Mass., 13,119; New Orleans, La., 12,862; and Detroit, Mich., 10,083.

Ninety Planes Enter Show

DETROIT, March 23—More than 90 airplanes, including nearly 40 craft of entirely new design recently offered to the market, have been entered in the National Aircraft Show of 1931, Edward S. Evans, chairman of the Show's Board of Control, announced today. The show will be held here at the Detroit Municipal Airport April 11 to 19.

S.A.E. Production Group Plans Spring Meeting

Sessions Will Be Held in Milwaukee

MILWAUKEE, March 24—This year, for the first time, the National Production Activity of the Society of Automotive Engineers will hold a spring meeting, in conjunction with the Milwaukee Section, S.A.E. The sessions will be held at the Hotel Schroder, Milwaukee, May 7 and 8. The program for the meeting has been developed cooperatively by J. R. Franz, chairman of the Milwaukee Section, and Joseph Geschelin, chairman, Papers and Meetings Committee of the Production Activity, and engineering editor of *Automotive Industries*. The full program for the sessions follows:

Thursday, May 7

Morning—Registration of attendance

1:30 P. M.—Technical Session (National Production Activity Committee)

(a) The Use of Power Driven Industrial Trucks in the Handling Systems of Automotive and Automotive Accessory Plants
C. B. Crockett, Industrial Truck Association

(b) Nickel Alloys in Automotive Manufacturing
T. H. Wickenden, International Nickel Co.

Evening—Feature Session by Milwaukee Section

Friday, May 8

9:30 A. M.—Technical Session (Milwaukee Section)

(a) New Developments in Surface Hardening of Steel and Their Effect on Cost of Production
H. E. Koch, Hevi-Duty Electric Co.

(b) Demonstration at plant of the Hevi-Duty Electric Co.

1:30 P. M.—Technical Session (Milwaukee Section)

(a) Latest Developments in High-Speed Milling with Tantalum and Tungsten-Carbide Cutters
F. W. Curtis—Kearney & Trecker Corp.

(b) Demonstration at plant of the Kearney & Trecker Corp.

6:30 P. M.—Milwaukee Section Production Dinner
Toastmaster, H. L. Horning, President, Waukesha Motor Co.
Speaker, Dr. E. A. Ross, Professor of Social and Political Science, University of Wisconsin
Aspects of Economical Production as They Affect Present Conditions

Airport Conference Planned

TULSA, March 23—Uniform traffic control at airports, a subject of growing importance in the major air transport traffic centers, will be one of the most vital subjects before several hundred airport engineers, managers, designers and constructors when they meet here, March 25 to 27, for the Third National Airport Conference of the Aeronautical Chamber of Commerce of America, Inc.

Motor Products Reports

DETROIT, March 23—Motor Products Corp., has reported net profit for year ended Dec. 31, 1930, of $487,139 after depreciation, federal taxes, etc., equal to $2.47 a share on 197,366 no-par shares of common stock. This compares with $2,140,848 or $10.42 a share on common after preferred dividends in 1929.

Six-Point Suspension

Dixon Motor Truck Corp., Inc., Altoona, Pa., is completing a new factory which will have a capacity of 25 trucks weekly. It is expected that the plant will be ready for occupancy on May 1 and will shortly after that begin production on heavy-duty trucks. All but two shares of the outstanding stock of the corporation are owned by Frank T. Dixon.

Cadillac Motor Co. has assumed control of the distribution agency in Columbus, Ohio. The Columbus branch will distribute the Cadillac and LaSalle lines in 22 counties in central Ohio. Don Cole is branch manager. He was formerly vice-president of the Towell-Cadillac Co., Cleveland.

Tentative specifications for electroplating will be submitted to the American Electroplaters Society and other organizations interested for comment and adoption by C. F. Nixon, Ternstedt Mfg. Co., and H. S. Lukens, University of Pennsylvania, chairman of two sub-committees of the American Electroplaters Society named to prepare the specifications. W. Blum presided at a conference on Jan. 17, at which the arrangement for appointing the sub-committees were discussed.

Plymouth Motor Corp. has announced that James F. Waters, San Francisco DeSoto-Plymouth dealer, recently completed a single sale of 140 new Plymouth automobiles to the Red Top Cab Co., San Francisco.

Waco Aircraft Co., Troy, Ohio, has adopted the Continental Model A76 Series engine as a standard powerplant for its 1931 models. The new Continental-equipped models will have their first showing at the Detroit Aircraft Show in April.

Auburn Automobile Co., Auburn, Ind., announces that it has opened an additional production line with a capacity of 85 cars daily at the Auburn plant. This assembly line will supplement production at the Connersville, Ind., plant, where the daily output has been averaging about 200 cars. All the convertible models comprising cabriolets and phaeton-sedans will be built at the Auburn plant. The manufacture of these models will also continue at Connersville.

The Detroit Aircraft Corp. announces that the feature of its line this year will be the Lockheed Orion low-wing monoplane with retractable landing-gear installation permitting a top speed of 201 m.p.h. and a cruising speed of over 175 m.p.h. The Lockheed Vega cabin monoplane, the Detroit Ryan brougham and foursome, the three-place Ryan speedster, the Detroit Eastman flying yacht—a four-place open ship—are other models which will be continued in production.

Goodyear Tire and Rubber Co. officials have announced the formal christening of the giant navy Zeppelin "Akron" will take place at the Municipal Airport, Akron, and not at the naval base at Lakehurst as previously reported. The exact time for the formal launching has not been set. As this announcement was made, the tail-piece of the Zeppelin framework was about ready to be put into position, completing the 785 ft. of framework.

Divine Bros. Co., Utica, N. Y., has announced the following list of officers for the year of 1931: President, Bradford H. Divine; vice-president, Robert T. Kent; treasurer, B. Dalton Divine; secretary and assistant treasurer, R. Irving Roberts; assistant secretary, B. M. Beach.

A Studebaker President eight captured first place in the third annual 200-mile Gilmore-Wrightwood mountain economy run in California. The event was supervised by the American Automobile Assn. The winning car was driven by Mrs. William Hurter.

John C. Hoof Co., Chicago, has recently opened a Detroit warehouse at 4809 Johns R. Street.

Century Airlines were officially opened March 23. The first unit will connect Chicago with St. Louis and Chicago and Cleveland.

De Vaux-Hall Motors Corp. has announced that production of the new De Vaux Six will begin April 1 instead of March 23, as previously announced.

Hupp Motor Car Corp. is sending around the country, in the interest of free-wheeling demonstration, a specially trimmed model known as the "White Ghost."

Automobile tourist camps have created a new public sanitation problem which will appear on the agenda of the American Public Health Assn., which will hold its 60th annual meeting in Montreal Sept. 14 to 17.

Gardner Will Offer Liquidation Plans

Company Has Had Long Manufacturing History

ST. LOUIS, March 24—The Gardner family of St. Louis, which forty-nine years ago began the manufacture of buggies here, developing one of the largest businesses of that line in the country, and turned to making automobiles in 1915, has decided to go out of business because of the difficulty a small, independent firm has in competing with the large manufacturers. It also plans to quit making airplanes.

Russell E. Gardner, Jr., and Fred W. Gardner, brothers, and heads of the Gardner Motor Co. are active partners in the brokerage firm of Reinholdt and Gardner. At a stockholders' meeting to be held in New York, April 17, four proposals will be submitted for disposal of the Gardner manufacturing interests, including a recommendation to abandon the automobile business and sell the assets; one proposition, which will require a two-thirds majority, will call for reducing the par value of the 300,000 shares of stock from $5 to $1 a share, or from $1,500,000 to $300,000. This would enable the company to pay cash dividends out of a surplus of $500,000 to $700,000 which is now part of the capital. Another proposal will be to distribute the approximately 30,000 shares of Detroit Aircraft Corp. stock held by the company on the basis of one share for each 10 of Gardner stock.

The Gardner brothers do not wish to assume the responsibility for deciding whether to sell or keep their securities which were obtained in exchange for an 80 per cent interest in the Parks Aircraft Co., which formerly made airplanes at Parks airport. The fourth proposal will be to authorize a cash distribution of 25 cents a share on Gardner stock.

The company's charter was broadened several years ago, permitting it to enter various enterprises including aviation and investment trusts. Its factory at Main and Rutger Sts. is being used now in part as a warehouse. The stock listed on the New York stock exchange is held by more than 4000 owners. The Gardner family has a substantial interest, but owns considerably less than half of the stock.

The latest quotation was $1.75 a share compared with a maximum of more than $30 in 1920. An additional 200,000 shares authorized in 1929 was not issued. Russell E. Gardner, who now resides in New Orleans, founded the Banner Buggy Co. in 1882. The business thrived until the coming of the automobile in 1915. He sold the remnant of that enterprise, which, under new owners went into bankruptcy in 1928. The elder Gardner formed the Chevrolet Motor Co. of St. Louis in 1915 and manufactured the early Chevrolet car under a territorial license from the Durant interests. This business was sold to the General Motors Corp. in 1918. The Gardner Co. established the following year, started with a four-cylinder car and brought out its eight-cylinder model in 1924. The last of probably more than 100,000 Gardners was made early this year and the stock is exhausted.

In 1929 the company planned to manufacture the Ruxton front-drive car, also a low-priced machine to be distributed by Sears, Roebuck & Co., mail order house, but these plans were dropped. The company had its own front-drive car, as a sample in the January, 1930 Automobile Show, but production was not begun because of unfavorable conditions last year. The engineering and sales staffs were consolidated with those of the old Moon Motor Car Co., to decrease costs.

Memphis Plant to Step-Up

MEMPHIS, March 24—The Ford Motor Co. Memphis branch, now running two days a week, will increase operations and output by April 1.

G. M. Stockholders Reach New Record

Corporation's Ownership In Hands of 286,378

NEW YORK, March 23—Stockholders in General Motors Corp. continue to increase in number, having reached a total of 286,378 during the first quarter of 1931. These are stockholders of record Jan. 5 for preferred stock and Feb. 14 for common stock. Common stockholders number 268,907 and preferred stockholders 17,471.

The total number of stockholders of both classes by quarters since 1917 follows:

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1917	1,927	2,525	2,669	2,920
1918	3,918	3,737	3,615	4,739
1919	8,012	12,523	12,358	18,214
1920	24,148	26,136	31,029	36,894
1921	49,035	59,059	65,324	66,837
1922	70,504	72,665	71,331	65,665
1923	67,115	67,417	68,281	68,063
1924	70,009	71,382	69,428	66,097
1925	60,458	60,414	58,118	50,917
1926	54,851	53,097	47,805	50,369
1927	56,520	57,595	57,190	66,209
1928	72,986	70,399	71,682	71,185
1929	105,363	125,165	140,113	198,600
1930	240,483	243,428	249,175	263,528
1931	286,378	....	....	....

Dodge Deliveries Increase

DETROIT, March 24—A material and progressive increase in retail deliveries of Dodge passenger cars and trucks, and Plymouth cars by Dodge dealers is reported in a statement issued here today by Dodge Brothers Corp.

Retail deliveries of Dodge passenger cars, trucks and Plymouth cars during the week ending Feb. 21, showed an increased of 10.1 per cent over the previous week. Retail deliveries of the same units the week ending Feb. 28, showed an increase of 9.2 per cent over the previous week. Similarly, deliveries for the week ending March 7, showed an increase of 8.7 per cent over the week before, the corporation reported.

U. S. Has 102 Airlines

WASHINGTON, March 24—A total of 102 domestic scheduled airlines were in operation as of March 1, 1931, according to the Aeronautics Branch, Department of Commerce. Of these lines 53 carried mail, 84 carried passengers and 58 carried express. Total length of scheduled routes for all services was 115,617 miles. Foreign routes with terminals in the United States numbered 18, according to the compilation.

Auburn Adds 81 Dealers

AUBURN, IND., March 25—Eighty-one new dealers were added by Auburn in the first nine days of March, N. E. McDarby, vice-president in charge of sales, has announced. Auburn also added 122 dealers in February of this year, a record for any corresponding monthly period.

Financial Notes

Aviation Corp. of America and subsidiaries report net loss for 1930 of $305,271 after all charges. This compares with loss for the previous year of $317,412.

Kelsey-Hayes Wheel Corp. reports net profit for 1930, after all charges, of $2,262,222. This is equivalent after preferred dividends to $2.69 a share and compares with earnings of $3,316,460, or $4.11 a share, for the previous year.

Black & Decker Mfg. Co. has declared regular quarterly dividend of 50 cents on preferred stock, payable March 31 to holders of record March 20.

Eaton Axle & Spring Co. has declared regular quarterly dividend of 40 cents on common stock, payable May 1 to holders of record April 15.

Gemmer Mfg. Co. has declared regular quarterly dividend of 75 cents on common stock, payable April 1 to holders of record March 25.

Goodyear Tire & Rubber Co. of California has declared regular quarterly dividend of $1.75 on preferred stock, payable April 1 to holders of record March 20.

McCord Radiator & Mfg. Co. has declared regular quarterly dividend of 75 cents on Class A stock, payable April 1 to holders of record March 24.

Ford Motor Co. of France has declared an increased dividend of 12½ per cent.

Houdaille-Hershey Corp. has declared an extra dividend of 62½ cents on Class A stock, payable April 1.

General Aviation Corp. and subsidiaries report net loss for 1930 of $2,133,858. This compares with net profit of Fokker Aircraft Corp. of America, the predecessor company, of $403,938 during 1929.

Fiat Co. has declared dividend of 94½ cents on American depositary receipts, payable March 31 to holders of record March 26, less tax and expenses of depositary.

Waco Aircraft Co. reports net loss for the year ended Dec. 31 of $106,550 after all charges. This compared with net profit of $109,408 in 1929.

Raybestos-Manhattan, Inc. and subsidiaries in a pamphlet report shows net income for year ended Dec. 31 of $1,156,770 after all charges. This compares with net income of $3,206,293 in 1929.

Warner Aircraft Corp. reports net loss for 1930 of $129,194 as compared with net loss of $39,966 in the preceding year.

Rolls-Royce, Ltd., has declared an extra dividend of 2 per cent.

E. W. Bliss Co. reports net profit for 1930 of $71,021 after all charges. This compares with earnings for 1929 of $2,097,944.

Rolls-Royce Co. of America reports net loss for 1930 of $714,253 after all charges. This compares with profit of $134,764, or $3.85 a share, for 1929. In addition to the operating loss for 1930 the company charged off $1,054,962 for obsolescence, loss on sales of machinery, equipment, etc.

Allis-Chalmers Mfg. Co. in its pamphlet report for 1930 shows net income of $3,604,609. This is equivalent to $2.86 a share and compares with earnings for 1929 of $4,330,880, or $3.81 a share.

Durant of Canada Plans Meeting

TORONTO, ONT., March 23—The annual general meeting and a special general meeting of stockholders of Durant Motors of Canada, Ltd., has been called for Tuesday, April 7, at Leaside. Mostly routine matters will occupy the annual meeting when shareholders will be asked to approve of the financial statement and the acts of the directors, elect directors and confirm two by-laws with regard to the holding of the annual meeting and forms of proxies. At the special general meeting, plans for the organization of Dominion Motors, Ltd., will come up and shareholders will be asked to approve of the sale of the assets of Durant Motors for 287,000 fully paid shares of the new company and the assumption of all Durant of Canada liabilities by Dominion Motors, Ltd.

Hupp to Establish Canadian Plant

Will Use Windsor Property Now Owned

DETROIT, March 23—The decision of the Hupp Motor Car Corp. to open an assembly plant in Canada to exclusively take care of Canadian business for the company was announced here this morning by company officials. The official statement reads:

"The Hupp Motor Car Corp. has definitely decided to open an assembly plant in Canada as soon as possible to exclusively take care of Canadian business.

"This decision was arrived at by the management to conform with the recent tariff act which considerably raised the duty on American-made motor cars. As soon as the plant can be opened for production, Canadian citizens will be able to purchase Canadian-made Hupmobiles produced by Dominion labor.

"Our plans call for the utilization of the extensive properties owned by the company in Windsor on Giles Boulevard near McDougall. Several acres of ground, as well as a very suitable plant and modern shipping accommodations will be converted into a modern factory. We will have, in this setup, approximately 30,000 feet of floor space to devote to manufacturing purposes.

"Our plans call for starting production within 90 days. Work is already under way to make this plant available, and, we feel certain, will tend to further relieve the present employment situation in the border cities."

Get Army Contracts

WASHINGTON, March 26—Contracts aggregating $1,269,652 for aircraft and engines have been approved by Assistant Secretary of War Trubee Davison.

The awards were as follows:

Verville Aircraft Co., Detroit, four primary training airplanes and spare parts, $27,227. The planes will be equipped with Wright air-cooled engines.

Thomas-Morse Aircraft Corp., Buffalo, 30 observation airplanes and spare parts, $450,000, the planes to be powered with Pratt & Whitney air-cooled engines.

Northrop Aircraft Corp., Burbank, Calif., three Northrop transport airplanes and spare parts, prints and data, $62,600, the craft to be powered with Pratt & Whitney air-cooled engines.

Pratt & Whitney, 128 engines, and spare parts, $728,912.

Inland Steel Plans Mill

CHICAGO, March 23—Work is to be started within a few weeks on the $10,000,000 strip mill project of the Inland Steel Co. at Indiana Harbor, Ind. The project will comprise five buildings housing a 1000-ft. strip mill, which will turn out sheet steel in one continuous operation. Bids on the materials are now being taken and work is to be started next month by the company's own construction department.

Equipment Business Marks Up an Increase

February Level Shows Improvement Over January

NEW YORK, March 23 — Sales of parts and equipment during February showed a general advance over January and in most cases show an improved position as compared with December of last year, according to the index figures prepared by the Motor and Equipment Association. In no case, however, has the figure reached levels shown during the first two months of last year.

Increased car production schedules for March are shown in the original equipment index, which reached a level of 95, as compared with 84 in January and with 64 in December. This former figure, however, compares with 141 in February of last year.

Sales of replacement parts have held fairly level for the past three months, being 99 for February, as compared with 98 in January and 100 in December of 1930.

Accessory sales continue comparative low, although much better than January and almost at December level.

Shop equipment was improved in February, reaching the figure of 97, as compared with 92 in January and 75 in December. Index for this group for February of last year was 151.

Grand index for the month of February was 93, as compared with 84 in January, 69 in December of 1930 and 138 in February a year ago.

Wholesalers' sales during February fell off, as compared with January, showing a steady decline for the past three months. Accounts receivable, however, showed a greater decline than sales, indicating a better position on wholesalers' books than was in existence during the previous months. The sales index for February is 81, as compared with 83 in January and 111 in December. This figure also compares with 90 for February, 1930.

The following table shows the advance registered during the first two months:

	Feb. 1931	Jan. 1931	Dec. 1930	Feb. 1930
Original Equipment	95	84	64	141
Service Parts	99	98	100	131
Accessories	53	46	55	66
Service Equipment	97	92	75	151
Grand Index	93	84	69	138

Sloan Emphasizes Accounting

NEW YORK, March 28—Alfred P. Sloan, Jr., president, General Motors Corp., has issued to General Motors dealers a booklet emphasizing the value to the dealers of the services of Motor Accounting Co. In this book Mr. Sloan emphasizes the need of fact finding in management of the distribution end of modern business. This type of service is rendered by the adoption of a comprehensive system of accounting to the distribution end and this is what is sought by the setting up of Motor Accounting Co.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

Los Angeles (Transportation).March 15-28
Altoona, Pa., Automobile.....April 15-27
International Garage Exposition, Berlin, Germany .....May 9-Aug. 9

CONVENTIONS

American Chemical Society, Indianapolis, Ind. .....March 30-April 4
Washington Motor Freight Assn., Meeting, Seattle, Wash. ..April 11-13
Aeronautical Chamber of Commerce, Detroit .....April 11-19
S.A.E. Natl. Aeronautic Meeting, Detroit, Mich.....April 15-16
Middle Atlantic Jobbers Convention, Philadelphia, Pa. .....April 20-21
American Welding Society Meeting, New York, N. Y. .....April 22-24
Natl. Battery Mfg. Assn. Convention, Niagara Falls .....April 24-25
Retail Delivery Assn. Convention, Washington, D. C. .....May 25-28
U. S. Chamber of Commerce, Atlantic City .....April 28-May 1
International Chamber of Commerce, Washington, D. C. .....May 4-9
National Foreign Trade Council, New York .....May 27-29
Fourth National Oil and Gas Power Meeting, A.S.M.E., Madison, Wis., June 15-18
S.A.E. Summer Meeting, White Sulphur Springs .....June 15-19
S.A.E. Aeronautic Meeting (in conjunction with Natl. Air Races), Cleveland, Ohio .....Sept. 1-3

Gets Federal Receiver

KANSAS CITY, March 21—A Federal receivership for the American Eagle Aircraft Corp., operating a factory at Fairfax Airport, has been ordered and J. F. Charlesworth appointed as receiver. The corporation has been in financial difficulties for several months. E. E. Porterfield, Jr., president of the company, is working out details with the receiver for keeping the factory in operation. He said the company had orders for 283 American Eaglet planes on file, 22 for immediate delivery. Production has been at a standstill. Assets of the company are reported as several times that of liabilities.

Nash Orders Increase

KENOSHA, WIS., March 23—March orders for Nash cars have increased 60.7 per cent in the period from March 1 through March 16, it was announced today by C. H. Bliss, sales manager of the Nash Motors Co.

This advancement in Nash business has necessitated an increase in Nash production schedules.

Producing Drift Indicator

NEW YORK, March 23—Pioneer Instrument Co., a division of Bendix Aviation Corp., has developed a new drift indicator which has been tried out for some time experimentally and is now entering into full production.

Air Mileage Increased 54 Per Cent in January

Number of Passengers Also Showed Gain

NEW YORK, March 23—Thirty major air transport lines report that 2,475,306 miles were flown in January, 1931, an increase of 867,970 miles, or 54 per cent, more than in January, 1930, according to a copyrighted report issued by the Aeronautical Chamber of Commerce of America, Inc.

Only 10 per cent of the total miles scheduled to be flown in January, 1931, were abandoned because of bad weather and other causes, as compared with 19 per cent in January a year ago.

A total of 17,549 passengers were reported carried on these air lines in January, 1931, an increase of 56 per cent, as compared with the first month of 1930, when 11,214 passengers were flown. The 17,549 passengers in January, 1931, flew 4,064,869 passenger miles, or an average of 232 miles per passenger.

Air mail poundage increased to a total of 778,937 lb. in January, 1931, according to the reports. This is an increase of nearly 50 per cent more than the 519,572 lb. carried in January a year ago.

Air express poundage in January, 1931, jumped to 61,063 lb. or twice the amount reported during the best month (June) in 1930.

Studebaker Changes Prices

SOUTH BEND, March 23—The following changes have been announced in the prices of passenger automobiles manufactured by the Studebaker Corp.:

Model and Type	New Price	Former Price
Commander Eight		
Brougham	$1,730	$1,785
Regal Sedan	1,730	1,785
President 130-in. Wheelbase		
State Sedan	1,995	2,050
State Coupe	1,995	2,050
President 136-in. Wheelbase		
State Tourer	2,095	2,150
State Victoria	2,295	2,350
Brougham	2,295	2,350
State Sedan	2,295	2,350

Kelly Elects Lalley

William H. Lalley of Detroit, identified for 17 years with the automotive industry, has been elected president of the Kelly-Springfield Tire Co., succeeding Samuel Woolner, Jr., resigned.

Mr. Lalley, in addition to recent automotive experience, has been identified with some of the nation's major banking interests and is one of the youngest executives to assume the presidency of a nation-wide organization.

Ex-Cell-O Reelects

DETROIT, March 20—All officers and directors of the Ex-Cell-O Aircraft & Tool Corp. were reelected at the annual stockholders' meeting on Feb. 26.